Scientific & Technical Information Center
USPTO

STIC Search Report
EIC 1700

STIC Database Tracking Number: 104223

TO: Lynette T Umez-Eronini
Location: CP3 10E12
Art Unit : 1765
September 25, 2003

Case Serial Number: 09/891730

From: John Calve
Location: EIC 1700
CP3/4-3D62
Phone: 308-4139

John.Calve@uspto.gov

Search Notes

sira
Search and Information Resources Administration

Access DB# 104223

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Lynette Van Zessen Examiner #: 14987 Date: 9/22/03
Art Unit: 1765 Phone Number 30 6-5624 Serial Number: 09/891,230
Mail Box and Bldg/Room Location: CP3 10E12 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

22

Earliest Priority Filing Date: _____

For Sequence Searches Only ***Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.***

****

STAFF USE ONLY	**Type of Search**		**Vendors and cost where applicable**	
Searcher: TC	NA Sequence (#)		STN	4
Searcher Phone #:	AA Sequence (#)		Dialog	
Searcher Location: 9/24/03	Structure (#)		Questel/Orbit	
Date Searcher Picked Up: 9/24/03	Bibliographic	✓	Dr.Link	✓
Date Completed: 9/24	Litigation		Lexis/Nexis	
Searcher Prep & Review Time: 1	Fulltext		Sequence Systems	
Clerical Prep Time:	Patent Family		WWW/Internet	
Online Time: 1 20	Other		Other (specify)	

PTO-1590 (8-01)

STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact:***

Kathleen Fuller, EIC 1700 Team Leader
308-4290, CP3/4-3D62

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art **not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC1700 CP3/4 3D62

```
=> file hca


FILE 'HCA' ENTERED AT 15:17:28 ON 24 SEP 2003
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)
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FILE COVERS 1907 - 18 Sep 2003 VOL 139 ISS 13
FILE LAST UPDATED: 18 Sep 2003  (20030918/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> d his

     (FILE 'HOME' ENTERED AT 14:48:20 ON 24 SEP 2003)

     FILE 'HCA' ENTERED AT 14:49:46 ON 24 SEP 2003
                E US20020102852/PN
L1             1 S E3
                SEL L1 RN
                S L*** AND  7732-18-5/REG#

     FILE 'REGISTRY' ENTERED AT 14:50:16 ON 24 SEP 2003

     FILE 'HCA' ENTERED AT 14:50:16 ON 24 SEP 2003

     FILE 'REGISTRY' ENTERED AT 14:50:47 ON 24 SEP 2003
L2            19 S E1-E19
L3             1 S L2 AND 1336-21-6
L4             1 S L2 AND 7722-84-1
L5             1 S L2 AND 7732-18-5

     FILE 'HCA' ENTERED AT 14:52:14 ON 24 SEP 2003
L6         16820 S L3 OR AMMONIUM#(N)HYDROXIDE#
L7         77407 S L4
L8        309980 S L5

     FILE 'HCA' ENTERED AT 14:53:30 ON 24 SEP 2003

     FILE 'LCA' ENTERED AT 14:53:33 ON 24 SEP 2003
L9           197 S AMMONIUM#(N)HYDROXIDE# OR NH4(W)OH OR NH4OH
L10          198 S (AMMONIUM# OR NH4)(N)HYDROXIDE# OR NH4(W)OH OR NH4OH
L11          376 S HYDROGEN#(N)PEROXIDE# OR H2O2
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L12         7537 S WATER# OR H2O
L13         1000 S SURFACT? OR BIOSURFACT? OR HYDROTROP? OR DETERG? OR ABSTERG?
L14         1358 S CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT? OR DECONTAMINA? O

     FILE 'HCA' ENTERED AT 14:58:12 ON 24 SEP 2003
L15        16820 S L6
L16        13167 S L3
L17        81521 S L10 OR L16
L18       166099 S L7 OR L11
L19      2764755 S L12 OR L8
L20         5450 S L17 AND L18
L21         3318 S L20 AND L19
L22       348318 S L13
L23       493124 S L14
L24          481 S L21 AND L14
L25           38 S L24 AND L22

     FILE 'LCA' ENTERED AT 15:02:28 ON 24 SEP 2003
L26         2633 S SEMI(W)CONDUCT? OR WAFER? OR DEVICE? OR SUBSTRATE? OR VLSI OR
L27            0 S L25 AND L26

     FILE 'HCA' ENTERED AT 15:04:04 ON 24 SEP 2003
L28           22 S L25 AND L26

     FILE 'LCA' ENTERED AT 15:04:55 ON 24 SEP 2003
L29         2604 S SULFATE? OR ETHER?
L30         3238 S ?ETHYLENE?

     FILE 'HCA' ENTERED AT 15:08:40 ON 24 SEP 2003
L31            9 S L25 AND L30
L32            8 S L25 AND L29
L33           12 S L31 OR L32
L34           34 S L25 AND 1907-2000/PY,PRY **** Date limited results******
L35            9 S L33 AND L34
L36           15 S L28 NOT L33
L37           14 S L36 AND L34
L38           11 S L34 NOT (L35 OR L36 OR L37)
L39            3 S L33 NOT L35
L40           15 S L36 NOT L35
L41           11 S L34 NOT (L35 OR L36)

=> d his nofile L42-

     (FILE 'JAPIO, WPIX' ENTERED AT 15:19:54 ON 24 SEP 2003)
L42         9548 SEA ABB=ON  PLU=ON  L9
L43        36138 SEA ABB=ON  PLU=ON  L11
L44      1753336 SEA ABB=ON  PLU=ON  L12
                 SET MSTEPS ON
L45        62332 SEA ABB=ON  PLU=ON  SURFACT? OR BIOSURFACT? OR HYDROTROP? OR
                 DETERG? OR ABSTERG? OR (SURFACE(W)ACTIVE# OR WETTING# OR
                 FOAMING#)(A)(AGENT? OR ADDITIVE? OR COMPOUND? OR COMPD# OR
                 CMPD#) OR EMULSIFIER? OR DISPERSANT?
L46       180908 SEA ABB=ON  PLU=ON  SURFACT? OR BIOSURFACT? OR HYDROTROP? OR
                 DETERG? OR ABSTERG? OR (SURFACE(W)ACTIVE# OR WETTING# OR
                 FOAMING#)(A)(AGENT? OR ADDITIVE? OR COMPOUND? OR COMPD# OR
                 CMPD#) OR EMULSIFIER? OR DISPERSANT?
     TOTAL FOR ALL FILES
L47       243240 SEA ABB=ON  PLU=ON  L13
L48       150090 SEA ABB=ON  PLU=ON  CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT?
                  OR DECONTAMINA? OR ABLUT? OR ELUTION# OR ELUTRIAT? OR SCRUB?
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                OR SCOUR? OR DEGREAS?
L49       346351 SEA ABB=ON  PLU=ON  CLEAN? OR DETERS? OR ABSTERS? OR EDULCORAT?
                  OR DECONTAMINA? OR ABLUT? OR ELUTION# OR ELUTRIAT? OR SCRUB?
                OR SCOUR? OR DEGREAS?
     TOTAL FOR ALL FILES
L50       496441 SEA ABB=ON  PLU=ON  L14
L51           38 SEA ABB=ON  PLU=ON  L42 AND L43 AND L44
L52          441 SEA ABB=ON  PLU=ON  L42 AND L43 AND L44
     TOTAL FOR ALL FILES
L53          479 SEA ABB=ON  PLU=ON  L42 AND L43 AND L44
                SET MSTEPS OFF
L54          479 SEA ABB=ON  PLU=ON  L51 AND (L47 OR L53)
                SET MSTEPS ON
L55           38 SEA ABB=ON  PLU=ON  L51 AND (L45 OR L51)
L56          441 SEA ABB=ON  PLU=ON  L51 AND (L46 OR L52)
     TOTAL FOR ALL FILES
L57          479 SEA ABB=ON  PLU=ON  L51 AND (L47 OR L53)
L58           20 SEA ABB=ON  PLU=ON  L51 AND L48
L59          160 SEA ABB=ON  PLU=ON  L52 AND L49
     TOTAL FOR ALL FILES
L60          180 SEA ABB=ON  PLU=ON  L53 AND L50

     FILE 'WPIX' ENTERED AT 15:24:53 ON 24 SEP 2003
                E US20020102852/PN
L61            1 SEA ABB=ON  PLU=ON  US2002102852/PN
                D SCAN
                D L61 MC

     FILE 'STNGUIDE' ENTERED AT 15:25:47 ON 24 SEP 2003

     FILE 'WPIX' ENTERED AT 15:27:54 ON 24 SEP 2003
L62        38735 SEA ABB=ON  PLU=ON  D11?/MC
L63       198397 SEA ABB=ON  PLU=ON  L04-C?/MC
L64       322217 SEA ABB=ON  PLU=ON  U11-C?/MC
L65           16 SEA ABB=ON  PLU=ON  L59 AND L13
L66          160 SEA ABB=ON  PLU=ON  L59 AND L14
L67            6 SEA ABB=ON  PLU=ON  L66 AND L62
L68            4 SEA ABB=ON  PLU=ON  L67 AND (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)

L69      2945741 SEA ABB=ON  PLU=ON  (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)
L70          135 SEA ABB=ON  PLU=ON  L66 AND L69
L71           12 SEA ABB=ON  PLU=ON  L65 AND L70
L72            9 SEA ABB=ON  PLU=ON  L71 NOT L68

     FILE 'JAPIO' ENTERED AT 15:34:44 ON 24 SEP 2003
L73      2745476 SEA ABB=ON  PLU=ON  (L26 OR IC OR INTEGRAT?(A)CIRCUIT?)
L74           20 SEA ABB=ON  PLU=ON  L55 AND L14
L75            0 SEA ABB=ON  PLU=ON  L74 AND L13
L76            1 SEA ABB=ON  PLU=ON  L55 AND L13
L77           16 SEA ABB=ON  PLU=ON  L74 AND L73

     FILE 'STNGUIDE' ENTERED AT 15:37:05 ON 24 SEP 2003

     FILE 'JAPIO' ENTERED AT 15:40:29 ON 24 SEP 2003
L78           17 SEA ABB=ON  PLU=ON  L77 OR L76
                D SCAN
L79      2411529 SEA ABB=ON  PLU=ON  SOLUTION# OR SOLN#
L80           16 SEA ABB=ON  PLU=ON  L78 AND L79
                SET MSTEPS ON
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     FILE 'HCA, WPIX, JAPIO' ENTERED AT 15:46:15 ON 24 SEP 2003
L81          66 DUP REM L25 L65 L71 L80 (16 DUPLICATES REMOVED)
L82          38 SEA L81
L83          28 SEA ABB=ON  PLU=ON  L82 AND L80
L84          12 SEA L81
L85          16 SEA L81

     FILE 'JAPIO' ENTERED AT 15:47:46 ON 24 SEP 2003
               SET MSTEPS OFF
L86          16 SEA L81
L87          15 SEA ABB=ON  PLU=ON  L77 AND L86

     FILE 'WPIX' ENTERED AT 15:49:08 ON 24 SEP 2003
L88          12 SEA L81
L89           8 SEA ABB=ON  PLU=ON  (L72 OR L68) AND L88


=> d L35 1-9 ibib abs hitind hitrn

L35  ANSWER 1 OF 9  HCA  COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER:        137:40135  HCA
TITLE:                   Stabilized alkaline solutions for cleaning
                         of semiconductor substrates for microelectronic
                         applications
INVENTOR(S):             Skee, David C.
PATENT ASSIGNEE(S):      USA
SOURCE:                  U.S. Pat. Appl. Publ., 27 pp., Cont.-in-part of U.S.
                         Ser. No. 688,559.
                         CODEN: USXXCO
DOCUMENT TYPE:           Patent
LANGUAGE:                English
FAMILY ACC. NUM. COUNT:  4
PATENT INFORMATION:

     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
     US 2002077259      A1   20020620      US 2001-859142   20010516 <--
     US 6599370         B2   20030729
     US 6585825         B1   20030701      US 2000-688559   20001016 <--
     WO 2002033033      A1   20020425      WO 2001-US42406  20010928 <--
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
             HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
             LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
             SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
             YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
             DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,
             BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
     AU 2001096947      A5   20020429      AU 2001-96947    20010928 <--
     EP 1326951         A1   20030716      EP 2001-977863   20010928 <--
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
PRIORITY APPLN. INFO.:                  US 2000-688559   A2 20001016 <--
                                        US 1998-85861P   P  19980518 <--
                                        US 1999-115084P  P  19990107 <--
                                        WO 1999-US10875  A2 19990517 <--
                                        US 2001-859142   A  20010516
                                        WO 2001-US42406  W  20010928
```

AB This invention relates to compns. useful in the microelectronics industry for **cleaning** semiconductor wafer substrates. Particularly, this invention relates to alk. stripping or **cleaning** compns. contg. bath stabilizing agents that are used for **cleaning** wafers having metal lines and vias by removing metallic and org. contamination without damaging the integrated circuits. The invention provides aq. alk. compns. useful in the microelectronics industry for stripping or **cleaning** semiconductor wafer substrates by removing photoresist residues and other unwanted contaminants. The compns. typically contain (a) one or more metal ion-free bases at sufficient amts. to produce a pH of .apprx.10-13 and .gtoreq.1 bath stabilizing agents having at least one pKa at 10-13 to maintain this pH during use; (b) optionally, .apprx.0.01% to .apprx.5% by wt. (expressed as % SiO2) of a **H2O**-sol. metal ion-free silicate; (c) optionally, .apprx.0.01% to .apprx.10% by wt. of .gtoreq.1 chelating agents; (d) optionally, .apprx.0.01% to .apprx.80% by wt. of .gtoreq.1 **H2O**-sol. org. cosolvents; and (e) optionally, .apprx.0.01% to .apprx.1% by wt. of a **H2O**-sol. **surfactant**.

IC ICM B08B007-00
ICS B08B003-00; C23G001-00; C23G001-02; C03C023-00; F23J001-00; B08B003-10; B08B003-14

NCL 510175000

CC 76-2 (Electric Phenomena)
Section cross-reference(s): 48

ST semiconductor material alk **cleaning** soln

IT Silicates, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Amino acids, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(chelating agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Alcohols, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cosolvent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Photoresists
(residue removal; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Amines, processes
Quaternary ammonium compounds, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Chelating agents
Cleaning
Interconnections, electric
Semiconductor materials
Stabilizing agents
Surfactants
(stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT Bases, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 107-15-3, 1,2-Ethanediamine, processes 109-76-2, 1,3-Propanediamine 110-60-1, 1,4-Butanediamine 124-09-4, 1,6-Hexanediamine, processes 373-44-4, 1,8-Octanediamine 589-37-7, 1,3-Diaminopentane 2783-17-7, 1,12-Dodecanediamine 15520-10-2, 2-Methyl-1,5-pentanediamine
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(bath stabilizing agent, semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 69-72-7, Salicylic acid, processes 94-67-7, Salicylaldoxime 97-05-2, 5-Sulfosalicylic acid 108-46-3, Resorcinol, processes 127-06-0, Acetone oxime 142-08-5, 2-Hydroxypyridine 504-15-4, Orcinol 608-25-3, 2-Methylresorcinol 626-64-2, 4-Hydroxypyridine 7664-38-2, Phosphoric acid, processes **7722-84-1**, **Hydrogen peroxide**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 60-00-4, (**Ethylenedinitrilo**)tetraacetic acid, processes 67-43-6, **Diethylenetriaminepentaacetic** acid 482-54-2, (1,2-Cyclohexylenedinitrilo)tetraacetic acid 869-52-3, **Triethylenetetraminehexaacetic** acid 1429-50-1 2809-21-4 3148-72-9, 1,3-Diamino-2-hydroxypropane-N,N,N',N'-tetraacetic acid 6419-19-8, Nitrilotris(**methylene**)triphosphonic acid 13291-61-7, trans-(1,2-Cyclohexylenedinitrilo)tetraacetic acid 13598-36-2D, Phosphonic acid, derivs. 15827-60-8, **Diethylenetriaminepenta**(**methylenephosphonic** acid) 34690-00-1 37971-36-1, 2-Phosphonobutane-1,2,4-tricarboxylic acid 83834-39-3 91987-74-5 92761-25-6 122114-60-7
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(chelating agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 7429-90-5, Aluminum, processes 11099-19-7
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**cleaning** of; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 56-81-5, Glycerol, processes 52928-63-9D, 1-Hydroxy-2-pyrrolidinone, alkyl derivs.
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(cosolvent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 62-49-7, Choline 75-59-2, Tetramethylammonium hydroxide 77-98-5, Tetraethylammonium hydroxide 462-94-2, 1,5-Pentanediamine 631-41-4, Tetraethanolammonium hydroxide 646-19-5, 1,7-Heptanediamine 646-24-2, 1,9-Nonanediamine 646-25-3, 1,10-Decanediamine 822-08-2, 1,11-Undecanediamine **1336-21-6D**, **Ammonium hydroxide**, derivs. 2052-49-5, Tetrabutylammonium hydroxide 4499-86-9, Tetrapropylammonium hydroxide 12794-95-5D, Ammonium silicate, derivs. 33667-48-0, Monomethyltriethanolammonium hydroxide 53116-81-7, Tetramethyl ammonium silicate 109334-81-8, Methyltriethylammonium hydroxide
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT 9014-85-1, Surfynol 465
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**surfactant**; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT **7722-84-1, Hydrogen peroxide**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(bath stabilizing agent; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

IT **1336-21-6D, Ammonium hydroxide**, derivs.
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(semiconductor **cleaning** soln. alk. component; stabilized alk. solns. for **cleaning** of semiconductor substrates for microelectronic applications)

L35 ANSWER 2 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 136:91434 HCA
TITLE: **Cleaning** method and solution for **cleaning** a wafer in a single wafer process
INVENTOR(S): Verhaverbeke, Steven; Truman, J. Kelly
PATENT ASSIGNEE(S): Applied Materials, Inc., USA
SOURCE: PCT Int. Appl., 58 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002001609	A2	20020103	WO 2001-US41160	20010626 <--
W: CN, JP, KR				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
US 2002102852	A1	20020801	US 2001-891730	20010625 <--
PRIORITY APPLN. INFO.:			US 2000-214116P P	20000626 <--
			US 2001-891730 A	20010625

AB The present invention is a novel **cleaning** method and a soln. for use in a single wafer **cleaning** process. According to the present invention the **cleaning** soln. comprises **NH4OH** , **H2O2**, **H2O** and a chelating agent. In an embodiment of the present invention the **cleaning** soln. also contains a **surfactant**. And still yet another embodiment of the present invention the **cleaning** soln. also comprises a dissolved gas such as H2. In a particular embodiment of the present invention, this soln. is used by spraying or dispensing it on a spinning wafer.

IC ICM H01L
CC 66-6 (Surface Chemistry and Colloids)
Section cross-reference(s): 76
ST wafer **cleaning** soln single process
IT Chelating agents
Surfactants
(**NH4OH/H2O2/H2O**/chelating agent/ **surfactant**; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT Carboxylic acids, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(chelating agent; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT Vapor deposition process
(chem.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT Annealing
Cavitation
Degassing
Oxidation
Spraying
Ultrasonic **cleaning**
(**cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT **Cleaning**
(megasonic; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT Ashing
(oxygen; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT Semiconductor materials
(wafer; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) **7722-84-1, Hydrogen peroxide**, processes **7732-18-5, Water**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**NH4OH/H2O2/H2O**/chelating agent/ **surfactant; cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 7782-44-7, Oxygen, processes 10028-15-6, Ozone, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(cavitation gases, oxidant in rinse soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7727-37-9, Nitrogen, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(cavitation gases; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 60-00-4, **Ethylenediaminetetraacetic** acid, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(chelating agent; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 70-51-9, Desferrioxamine B 869-52-3, TTHA 7782-91-4, Molybdic acid 26636-37-3 35998-29-9 256326-70-2 385765-20-8, MCX-SD 2000
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 1333-74-0, Hydrogen, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(dissolved gas, cavitation gas; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

IT 7664-39-3, Hydrogen fluoride, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(etching soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
IT 124-38-9, Carbon dioxide, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(to dissipate static electricity in rinse soln.; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)
IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) **7722-84-1, Hydrogen peroxide**, processes **7732-18-5, Water**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**NH4OH/H2O2/H2O**/chelating agent/ **surfactant**; **cleaning** method and soln. for **cleaning** a wafer in a single wafer process)

L35 ANSWER 3 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 133:47594 HCA
TITLE: Wet **cleaning** of silicon carbide ceramics
INVENTOR(S): Otsuki, Masami; Wada, Hiroaki
PATENT ASSIGNEE(S): Bridgestone Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000169233	A2	20000620	JP 1998-348701	19981208 <--
US 2002005213	A1	20020117	US 1999-449764	19991126 <--

PRIORITY APPLN. INFO.: JP 1998-348700 A 19981208 <--
JP 1998-348701 A 19981208 <--

AB SiC ceramics are immersed in a semiaq. org. solvent, an aq. ammonium soln., an inorg. acid aq. soln., and then pure **water**. The treatment with the aq. ammonium soln. may be skipped, or the order of the treatment with aq. ammonium soln. and the inorg. acid aq. soln. may be reversed. Impurities in the surface and close to the surface of the SiC ceramics can be easily removed in high efficiency.
IC ICM C04B035-565
ICS H01L021-304
CC 57-2 (Ceramics)
ST **cleaning** wet silicon carbide ceramic impurity removal
IT Petroleum hydrocarbons
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT Glycols, uses
Glycols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**ethers, cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT **Ethers**, uses
Ethers, uses
RL: NUU (Other use, unclassified); USES (Uses)

(glycol, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT **Surfactants**
(nonionic, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT Acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(org., esters, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT Quaternary ammonium compounds, uses
RL: NUU (Other use, unclassified); USES (Uses)
(tetraalkyl, halides, **cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT Ceramics
Cleaning
(wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT **1336-21-6, Ammonium hydroxide** 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses **7722-84-1, Hydrogen peroxide**, uses **7732-18-5, Water**, uses 7790-98-9D, Ammonium perchlorate, tetraalkyl 10028-15-6, Ozone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT 7429-90-5, Aluminum, processes 7439-89-6, Iron, processes 7440-02-0, Nickel, processes 7440-09-7, Potassium, processes 7440-23-5, Sodium, processes 7440-42-8, Boron, processes 7440-47-3, Chromium, processes 7440-50-8, Copper, processes 7440-66-6, Zinc, processes 7440-70-2, Calcium, processes
RL: REM (Removal or disposal); PROC (Process)
(impurity; wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT 409-21-2, Silicon carbide (SiC), processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(wet **cleaning** of SiC ceramics for removal of impurities in surface region)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** with; wet **cleaning** of SiC ceramics for removal of impurities in surface region)

L35 ANSWER 4 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 126:200940 HCA
TITLE: Method and compositions for **cleaning** surface of substrate
INVENTOR(S): Morinaga, Hitoshi; Fujisue, Masaya
PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan; Morinaga, Hitoshi; Fujisue, Masaya
SOURCE: PCT Int. Appl., 60 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 9705228	A1	19970213	WO 1996-JP2077	19960725 <--
W: KR, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 09040997	A2	19970210	JP 1995-191504	19950727 <--
JP 3198878	B2	20010813		
JP 09067688	A2	19970311	JP 1995-243859	19950830 <--
JP 09082676	A2	19970328	JP 1995-257237	19950911 <--
JP 09082677	A2	19970328	JP 1995-257238	19950911 <--
JP 09100494	A2	19970415	JP 1995-279913	19951004 <--
JP 09241612	A2	19970916	JP 1996-56087	19960313 <--
JP 3303655	B2	20020722		
EP 789071	A1	19970813	EP 1996-925074	19960725 <--
R: DE, FR, GB				
TW 401604	B	20000811	TW 1996-85109284	19960730 <--
JP 09111224	A2	19970428	JP 1996-229441	19960813 <--
JP 09157692	A2	19970617	JP 1996-281290	19961003 <--
US 5885362	A	19990323	US 1997-809147	19970514 <--
US 6228823	B1	20010508	US 1998-218000	19981222 <--
US 2002045556	A1	20020418	US 2000-749545	20001228 <--
US 6498132	B2	20021224		

PRIORITY APPLN. INFO.:	JP 1995-191504	A	19950727 <--
	JP 1995-230700	A	19950817 <--
	JP 1995-243859	A	19950830 <--
	JP 1995-257237	A	19950911 <--
	JP 1995-257238	A	19950911 <--
	JP 1995-279912	A	19951004 <--
	JP 1995-279913	A	19951004 <--
	JP 1996-56087	A	19960313 <--
	WO 1996-JP2077	W	19960725 <--
	US 1997-809147	A3	19970514 <--
	US 1998-218000	A3	19981222 <--

OTHER SOURCE(S): MARPAT 126:200940

AB The title compns. esp. useful for **cleaning** electronic or semiconductor devices comprise a liq. medium contg. a complexing agent as a preventer for metal deposition, where the complexing agent comprise (A) complexing agents having arom. ring bearing OH or/and O- group, and/or (B) complexing agents having a N, halogen, S or/and O donor atom in the mol. or carboxylic acid groups, hydroxy mono- or dicarboxylic acid complexing agents having .ltoreq.4 OH groups and complexing agents having a carbonyl group. Thus, a **cleaning** compn. comprised a medium made up from a 30% aq. NH3, 31% **H2O2** and **water** at vol. ratio of 0.25:1:5, and 0.01% EDDHA, and contained only 10 ppb each of Al and Fe chloride as impurities for good **cleaning** performance.

IC ICM C11D007-04
ICS C11D007-26; H01L021-304; C23F001-32; B21B045-02

CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 76

ST silicon wafer **cleaning** soln metal scavenger; chelating agent wafer **cleaning** soln; complexing agent wafer **cleaning** soln; arom chelating agent **cleaning** wafer; ammonia soln wafer **cleaning** soln; **hydrogen peroxide** wafer **cleaning**; EDDHA wafer **cleaning** soln

IT Chelating agents
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)

IT Polyphosphoric acids
RL: TEM (Technical or engineered material use); USES (Uses)
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)

IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(dicarboxylic, **detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)
IT **Detergents**
Semiconductor devices
(method and compns. for **cleaning** surface of substrate such as silicon wafer)
IT Acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(oxo, **detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)
IT 56-40-6, Glycine, uses 60-00-4, EDTA, uses 64-19-7, Acetic acid, uses 66-71-7, o-Phenanthroline 67-63-0, Isopropyl alcohol, uses 69-72-7, Salicylic acid, uses 75-05-8, Acetonitrile, uses 75-59-2, TMAH 87-69-4, uses 95-15-8, Benzothiophene 97-05-2, Sulfosalicylic acid 102-71-6, uses 110-85-0, **Diethylenediamine**, uses 115-41-3, Pyrocatechol violet 120-80-9, 1,2-Benzenediol, uses 123-54-6, Acetylacetone, uses 123-91-1, 1,4-Dioxane, uses 139-13-9, Nitrilotriacetic acid 141-82-2, Malonic acid, uses 142-73-4, Iminodiacetic acid 144-62-7, Ethanedioic acid, uses 148-24-3, 8-Quinolinol, uses 149-45-1, Tiron 463-79-6, Carbonic acid, uses 584-08-7, Potassium carbonate 1170-02-1, EDDHA **1336-21-6**, **Ammonium hydroxide** 1343-98-2, Silicic acid 1571-36-4, Stilbazo 1787-61-7, Eriochrome Black T 2050-14-8, o,o'-Dihydroxyazobenzene 5287-25-2, Oxalic acid bis(salicylaldehyde hydrazide) 7601-90-3, Perchloric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-39-3, Hydrogen fluoride, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses **7722-84-1**, **Hydrogen peroxide**, uses 7758-09-0, Potassium nitrite 7778-80-5, Potassium **sulfate**, uses 7782-77-6, Nitrous acid 7790-92-3, Hypochlorous acid 10043-35-3, Boric acid (H3BO3), uses 10380-08-2, Tripolyphosphoric acid 13898-47-0, Chlorous acid 26628-22-8, Sodium azide 35998-29-9, HBED
RL: TEM (Technical or engineered material use); USES (Uses)
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)
IT 3147-14-6, Calmagite
RL: TEM (Technical or engineered material use); USES (Uses)
(method and compns. for **cleaning** surface of substrate such as silicon wafer)
IT **1336-21-6**, **Ammonium hydroxide**
7722-84-1, **Hydrogen peroxide**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**detergent** compns.; method and compns. for **cleaning** surface of substrate such as silicon wafer)

L35 ANSWER 5 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 108:40149 HCA
TITLE: Method of liquid **detergents** and liquid cosmetic agents preparation
INVENTOR(S): Haumer, Jaroslav; Lopata, Vaclav; Novak, Vaclav; Rieger, Frantisek; Ditl, Pavel; Bares, Milan; Kepl, Jiri; Novak, Jan; Spal, Milan
PATENT ASSIGNEE(S): Czech.
SOURCE: Czech., 6 pp.
CODEN: CZXXA9
DOCUMENT TYPE: Patent
LANGUAGE: Czech
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CS 238069	B1	19851113	CS 1982-9866	19821228 <--
PRIORITY APPLN. INFO.:			CS 1982-9866	19821228 <--

AB Neutralization of the acid form of synthetic **surfactants** in the presence of EtOH or HOCH2CH2OH is accompanied by a decrease in viscosity and the evolution of heat which accelerate the process and permit continuous operation. Alkylbenzenesulfonic acid (380 kg) was treated simultaneously with EtOH 216.7, **H2O2** soln. 2.5, and aq. **NH4OH** 140 kg/h, and the mixt. was continuously homogenized with a mixt. of Na alkyl **ether sulfate** 420, Na lauryl **sulfate** 312.5, Na sulfosuccinate 120, fatty acid diethanolamide 22.5, Na nitrilotriacetate 10, and **water** 860 kg/h to give a clear liq. **cleanser** having pH 6.

IC ICM C11D011-04

CC 46-6 (Surface Active Agents and Detergents)

ST **cleaner** liq manuf acid neutralization; ethanol **cleaner** liq neutralization; **ethylene** glycol **cleaner** liq neutralization; alkylbenzenesulfonic neutralization liq **cleaner**; ammonia neutralization alkylbenzenesulfonic **cleaner**

IT **Detergents**
(**cleaning** compns., liq., alkylbenzenesulfonic acid neutralization in manuf. of)

IT 64-17-5, Ethanol, uses and miscellaneous 107-21-1, **Ethylene** glycol, uses and miscellaneous
RL: USES (Uses)
(alkylbenzenesulfonic acid neutralization in presence of, for liq. **cleaner**)

L35 ANSWER 6 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 94:94799 HCA
TITLE: Surface-treating agent adapted for intermediate products of a semiconductor device
INVENTOR(S): Asano, Masafumi; Muraoka, Hisashi; Ohashi, Taizo; Shimazaki, Yuzo
PATENT ASSIGNEE(S): Tokyo Shibaura Electric Co., Ltd., Japan
SOURCE: U.S., 14 pp. Division of U.S. Ser. No. 718,911. CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 5
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4239661	A	19801216	US 1978-927139	19780721 <--
JP 52064878	A2	19770528	JP 1975-140722	19751126 <--
JP 56053211	B4	19811217		
JP 52064871	A2	19770528	JP 1975-140725	19751126 <--
JP 53020377	B4	19780626		
JP 52064877	A2	19770528	JP 1975-140721	19751126 <--
JP 52064870	A2	19770528	JP 1975-140724	19751126 <--
JP 53020376	B4	19780626		
JP 52064876	A2	19770528	JP 1975-140723	19751126 <--
JP 53043012	B4	19781116		
US 4339340	A	19820713	US 1980-213317	19801205 <--
PRIORITY APPLN. INFO.:			JP 1975-140721	19751126 <--
			JP 1975-140722	19751126 <--

JP 1975-140723 19751126 <--
JP 1975-140724 19751126 <--
JP 1975-140725 19751126 <--
US 1976-718911 19760830 <--
JP 1976-140726 19761126 <--
JP 1975-140726 19751126 <--
US 1978-927139 19780721 <--

AB An aq. soln. contg. 0.01-20 wt.% of .gtoreq.1 trialkyl(hydroxyalkyl) **ammonium hydroxide**, where the 3 alkyl groups have 1-4 C atoms and the alkyl in the hydroxyalkyl group is an alkylene group with 2-4 C atoms, is used to **clean** the surface of an intermediate product obtained in the manuf. of semiconductor devices. The aq. soln. may contain further 0.01-10 parts by wt., based on 100 parts by wt. of the aq. soln., of .gtoreq.1 complexing agent capable of forming a **H2O** -sol. complex with metals, e.g. NaCN, NH4CN, triethanolamine. In addn., the aq. soln. may contain a nonionic **surfactant** in an amt. of 0.001-5 parts by wt. based on 100 parts by wt. soln., in particular poly(**oxyethylene**)nonylphenyl **ether**. **H2O2**, 0.003-30 parts by wt. may be present based on 100 parts by wt. of aq. soln. The solns. can be used also to remove photoresist films and etch metal (e.g. Al) layers in semiconductor technol. The use of trimethyl(2-hydroxyethyl) **ammonium hydroxide** is described in detail.

IC C11D003-26; C11D003-30; C11D007-32
NCL 252541000
CC 76-13 (Electric Phenomena)
Section cross-reference(s): 74

IT Etching
(of semiconductor devices, soln. contg. trialkyl(hydroxyalkyl) **ammonium hydroxide** for)

IT Semiconductor devices
(surface-treating agents for use in fabrication of, contg. trialkyl(hydroxyalkyl)**ammonium hydroxide**)

IT 102-71-6, uses and miscellaneous 143-33-9 **7722-84-1**, uses and miscellaneous 9016-45-9 12211-52-8
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(surface-treating agent contg., in fabrication of semiconductor devices)

IT **7722-84-1**, uses and miscellaneous
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(surface-treating agent contg., in fabrication of semiconductor devices)

L35 ANSWER 7 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 76:115225 HCA
TITLE: Dry **cleaning** with **hydrogen peroxide**
INVENTOR(S): Keay, Robert E.; Castrantas, Harry M.; MacKellar, Donald G.
PATENT ASSIGNEE(S): FMC Corp.
SOURCE: U.S., 4 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

US 3635667	A	19720118	US 1970-57817	19700723 <--
DE 2133898	A	19720127	DE 1971-2133898	19710707 <--
FR 2099535	A1	19720317	FR 1971-25463	19710712 <--
BE 770008	A1	19720114	BE 1971-105919	19710714 <--
JP 51000966	B4	19760113	JP 1971-52470	19710716 <--

PRIORITY APPLN. INFO.: US 1970-57812 19700723 <--
US 1970-57817 19700723 <--

AB A mixt. of **hydrogen peroxide** [**7722-84-1**], **water**, and **ammonium hydroxide** [**1336-21-6**] was added to conventional drycleaning baths to improve the whiteness of fabrics without their damage. A **cleaning** bath contg. **perchloroethylene** 500, dodecylbenzenesulfonate isopropylamine salt 4, 50% **H2O2** 2, and 2% **NH4OH** 1 lb. **cleaned** cotton and cotton-Dacron blends more efficiently than similar compns. contg. no **H2O2**, **NH4OH**, and **water**.

IC D06L
NCL 008142000
CC 46 (Surface Active Agents and Detergents)
ST **hydrogen peroxide** drycleaning; **ammonium hydroxide** drycleaning; whiteness textile
IT **Detergents**
(dry-**cleaning**, contg. **ammonium hydroxide** and **hydrogen peroxide**, for improved whiteness)
IT **7722-84-1**, uses and miscellaneous
RL: USES (Uses)
(**detergent** compns. contg. **ammonium hydroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron with improved whiteness)
IT **1336-21-6**
RL: USES (Uses)
(**detergent** compns. contg. **hydrogen peroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron, with improved whiteness)
IT **7722-84-1**, uses and miscellaneous
RL: USES (Uses)
(**detergent** compns. contg. **ammonium hydroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron with improved whiteness)
IT **1336-21-6**
RL: USES (Uses)
(**detergent** compns. contg. **hydrogen peroxide** and, for dry **cleaning** of textiles contg. cotton and Dacron, with improved whiteness)

L35 ANSWER 8 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 64:85640 HCA
ORIGINAL REFERENCE NO.: 64:16151a-b
TITLE: Rug-**cleaning** compositions
PATENT ASSIGNEE(S): Benjamin M. Hulsh
SOURCE: 5 pp.
DOCUMENT TYPE: Patent
LANGUAGE: Unavailable
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3240713		19660315	US	19620802 <--

AB Wood flour used in the above compns. is bleached in situ by including Na

perborate (I), **H2O2** plus **NH4OH**, K2S2O8, or Na2S2O8 in the mixt. The compn. contains wood flour 18-35, a bleaching agent 0.20-1.0, **H2O** 25-70, a low-boiling solvent 10-40, a nonionic and nonsoap org. **detergent** 0.25-1.0, Na3-PO4.12H2O (I), Na4P2O7, or K4P2O7 0.25-1.0, and, if desired, a cellulose dye 0.001-0.05%. Solvents include naphtha, mineral spirits, Stoddard solvent, CHCl:CCl2 (II), CCl4, MeCCl3, or their mixts. Thus, a compn. contains maplewood flour 25, **H2O** 38+, petroleum fraction 25, II 10, Na lauryl **sulfate** 0.5, Na3PO4 0.4, I 0.4, and Pontamine red dye 0.01% by wt.

NCL 252139000
CC 53 (Surface-Active Agents and Detergents)
IT Carpets and Rugs
(**cleaning** compns. for, with in situ bleaching of wood flour)
IT Wood
(flour or meal, rug **cleaning** compns. contg., with in situ bleaching agent)
IT Bleaching agents
(rug **cleaning** compns. contg., for in situ bleaching of wood flour)

L35 ANSWER 9 OF 9 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 55:90281 HCA
ORIGINAL REFERENCE NO.: 55:17036d-h
TITLE: Flameproofing agents for cellulosic materials
INVENTOR(S): Coates, Harold
PATENT ASSIGNEE(S): Albright & Wilson Ltd.
DOCUMENT TYPE: Patent
LANGUAGE: Unavailable
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2983623		19610509	US	<--

AB The properties of cellulose are improved by treatment with a partially polymerized hydroxymethyl phosphorous compd. contg. .gtoreq. 1 free OH group attached to P and then exposing the cellulose in the dry state to the action of gaseous NH3 followed by an aq. **NH4OH** treatment. Thus, a tetrakis(hydroxylmethyl)phosphonium chloride, (THPC)-urea precondensate (I), was prepd. by refluxing THPC 3160 and urea 498 in **H2O** 4012 parts for 30 min. with subsequent rapid cooling. To the I, a nonionic **wetting agent** (alkyl phenyl **ethylene** oxide condensation product) 20, and **H2O** 5000 parts were added. A **scoured** and bleached cotton fabric was impregnated with this soln. and squeezed to retain 74 parts soln. per 100 parts fabric. The impregnated fabric was dried at 90-5.degree., and then exposed for 10 min. to NH3 vapor by passing it over a **NH4OH** soln. (d. 0.910). The fabric was then treated in the **NH4OH** soln. (10 parts) in cold **H2O** (90 parts) for 10 min. The fabric was removed from soln. and without rinsing was washed in a soln. of soap 5 and **H2O2** (100 vol.) 2 in **H2O** 1000 parts for 10 min. at 40-50, then for 10 min. at 90-5.degree. before finally being rinsed in hot **H2O**, squeezed, and dried at 120.degree.. The dried fabric showed an increase of 11% in wt. compared to the original fabric. It had excellent resistance to burning and afterglow. This property was not impaired by subjecting the fabric to 10 successive 1-hr. boiling washes in a soln. of soap, 2, anhyd. Na2CO3 2, and **H2O** 1000 parts. Cf. U. S. 2,772,188 (CA 51, 7735c).

CC 25 (Dyes and Textiles)
IT Textiles

(fire- or flameproofing cotton, with phosphonium chloride deriv.-urea condensation products mixed with alkyl phenyl **ethylene** oxide condensate)

=> d L36 1-15 ibib abs hitind hitrn

L36 ANSWER 1 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 139:93764 HCA
TITLE: Method for post-etch and strip residue removal on coral films
INVENTOR(S): Mikhaylichenko, Katrina; Ravkin, Michael; Delarios, John
PATENT ASSIGNEE(S): Lam Research Corporation, USA
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003058694	A1	20030717	WO 2002-US40987	20021220

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2001-33644 A 20011227

AB A method for **cleaning** a semiconductor **wafer** is provided which includes plasma etching a feature into a low K dielec. layer having a photoresist mask where the plasma etching generates etch residues. The method also includes ashing the semiconductor **wafer** to remove the photoresist mask where the ashing generating ashing residues. The method further includes removing the etching residues and the ashing residues from the low K dielec. layer where the removing is enhanced by **scrubbing** the low K dielec. layer of the semiconductor **wafer** with a wet brush that applies a fluid mixt. including a **cleaning** chem. and a **wetting agent**
.

IC ICM H01L021-20
ICS H01L021-336
CC 76-3 (Electric Phenomena)
ST semiconductor **wafer cleaning** etch residue removal
IT **Surfactants**
(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)
IT Semiconductor **device** fabrication
(**wafer**; method for post-etch and strip residue removal on coral films)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized; method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)

IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, processes
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized; method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, processes
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(method for post-etch and ashing residue removal by **cleaning** with fluid mixt.)
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 2 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 136:111177 HCA
TITLE: Evaluation of **cleaning** results for semiconductor **wafers** in semiconductor **device** fabrication
INVENTOR(S): Ota, Katsuhiro; Takahara, Yoichi; Hara, Koji; Akimori, Hiroko; Tomioka, Hideki; Ito, Masaki; Tsugane, Masaru
PATENT ASSIGNEE(S): Hitachi Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002016119	A2	20020118	JP 2000-200062	20000628

PRIORITY APPLN. INFO.: JP 2000-200062 20000628
AB Title method is based on the collection of data from a micro-groove structure (e.g., nitrides) formed on a sampling **wafer**, to evaluate the penetration and drying results of the **cleaning** soln.
IC ICM H01L021-66
ICS B08B003-04; B08B003-08; C11D007-08; C11D007-10; C11D007-18; C11D007-26; C11D007-50; C11D017-08; H01L021-3065; H01L021-304
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 46
ST nitride thin film sampling **wafer cleaning** evaluation groove structure
IT **Surfactants**
(amphoteric; thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT **Surfactants**
(anionic; thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT **Surfactants**
(cationic; thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT Nitrides
RL: TEM (Technical or engineered material use); USES (Uses)

(for coating sampling **wafer** to evaluate **cleaning** result)
IT Solvents
(org.; thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT Acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(org.; thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT Semiconductor materials
(thin film-coated sampling **wafer** for evaluating **cleaning** result for)
IT Semiconductor **device** fabrication
(thin film-coated sampling **wafer** for evaluating **cleaning** result in)
IT Alkali metal hydroxides
Amines, uses
RL: NUU (Other use, unclassified); USES (Uses)
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT 12033-89-5, Silicon nitride (Si3N4), uses 25583-20-4, Titanium nitride
RL: TEM (Technical or engineered material use); USES (Uses)
(for coating sampling **wafer** to evaluate **cleaning** result)
IT 64-19-7, Acetic acid, uses **1336-21-6**, Ammonia **water**
7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses
7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses
7722-84-1, **Hydrogen peroxide**, uses
12125-01-8, Ammonium fluoride
RL: NUU (Other use, unclassified); USES (Uses)
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)
IT **1336-21-6**, Ammonia **water** **7722-84-1**, **Hydrogen peroxide**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(thin film-coated sampling **wafer** for evaluating **cleaning** result of)

L36 ANSWER 3 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 134:65061 HCA
TITLE: Silicon **wafer** **cleaning** process for post-chemical mechanical polishing using immersion in chem. megasonic baths
INVENTOR(S): Hackenberg, Diana
PATENT ASSIGNEE(S): Intersil Corp., USA
SOURCE: Eur. Pat. Appl., 6 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1065708	A2	20010103	EP 2000-104706	20000303
EP 1065708	A3	20020710		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6526995	B1	20030304	US 1999-342948	19990629
JP 2001044155	A2	20010216	JP 2000-173059	20000609

US 2003121528 A1 20030703 US 2003-358932 20030205
PRIORITY APPLN. INFO.: US 1999-342948 A 19990629
AB Silicon **wafer cleaning** process includes steps of detg. the pH of substances on the surface of the **wafer**, adjusting the pH of a megasonic chem. bath to match the pH of the substance, immersing the **wafer** in a first chem. megasonic bath with a pH that matches the pH of the substance to be removed, **cleaning** the **wafer** in the megasonic bath.
IC ICM H01L021-306
CC 76-3 (Electric Phenomena)
ST silicon **wafer cleaning** chem mech polishing immersion
IT **Surfactants**
(NWC-601; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT Polishing
(chem.-mech.; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT **1336-21-6, Ammonium hydroxide** 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9, Sulfuric acid, uses **7722-84-1, Hydrogen peroxide**, uses 116263-65-1, Ammonium peroxide
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** soln.; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT 37204-13-0, SC-2 136376-36-8, SC-1
RL: NUU (Other use, unclassified); USES (Uses)
(silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT 7440-21-3, Silicon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**wafer**; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** soln.; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized; silicon **wafer cleaning** process for post-chem. mech. polishing using immersion in chem. megasonic baths)

L36 ANSWER 4 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 134:7944 HCA
TITLE: Wet-process **cleaning** and etching of copper surfaces in electronic or semiconductor assemblies
INVENTOR(S): Verhaverbeke, Steven
PATENT ASSIGNEE(S): CFMT, Inc., USA
SOURCE: PCT Int. Appl., 32 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000071782	A1	20001130	WO 2000-US14019	20000519
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1198620	A1	20020424	EP 2000-936165	20000519
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003500537	T2	20030107	JP 2000-620153	20000519

PRIORITY APPLN. INFO.: US 1999-135267P P 19990521
WO 2000-US14019 W 20000519

AB The Cu-contg. electronic components are processed by: (a) the 1st-stage **cleaning** with aq. oxidizing soln. contg. **H2O2**, O3, and/or Fe cyanide at pH .gtoreq.7; (b) rinsing with low-O2 liq.; and (c) etching with aq. acidic soln. contg. HCl, H2SO4, HF, H3PO4, AcOH, citric acid, and/or tartaric acid for pH <5, as well as low dissolved O2 to prevent reoxidn. The 1st-stage aq. soln. preferably contains **H2O2** and **NH4OH** at 1 vol. each in 5-200 vols. of **water**. The acidic etching soln. preferably contains **water**, HF, and HCl at the vol. ratio of (50-1000):1:1 and pH .ltoreq.3, optionally with a **surfactant** and/or corrosion inhibitor. The Cu-coated semiconductor **wafers** were **cleaned** using the aq. soln. having the **water:H2O2:NH4OH:** **surfactant** vol. ratio of 100:2.2:1.3:0.25, rinsed with deionized **water**, and etched with the acidic soln. having the **water** :HF:HCl vol. ratio of 100:0.2:1 with O2 <100 ppb. The **cleaned** Cu showed contamination particle removal of 99.9% in the 18-400 .mu.m size range, vs. only .apprx.80% without the oxidizing or acidic stage.

IC ICM C23F003-00
ICS B08B003-00

CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76

ST copper surface **cleaning** semiconductor **wafer**; oxidizing aq bath **cleaning** copper elec circuit; acidic aq bath etch **cleaning** copper surface

IT Etching
(**cleaning** and; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT Semiconductor materials
(copper-coated, **cleaning** of; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT Integrated circuits
(copper-contg.; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT **1336-21-6, Ammonium hydroxide** 1948-47-6, Ferrous cyanide **7722-84-1, Hydrogen peroxide** , uses 10028-15-6, Ozone, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**cleaning** bath contg.; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT 7440-50-8, Copper, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**cleaning** of; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT 64-19-7, Acetic acid, uses 77-92-9, Citric acid, uses 87-69-4, Tartaric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9, Sulfuric acid, uses
RL: MOA (Modifier or additive use); USES (Uses)
(etch **cleaning** bath contg.; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

IT 7440-21-3, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(semiconductor **wafers**, copper-coated; wet-process **cleaning** and etching of copper surface on semiconductor **wafers**)

IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**cleaning** bath contg.; wet-process **cleaning** and etching of copper surfaces in electronic assemblies)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 5 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 133:275225 HCA
TITLE: Method for **cleaning** silicon **wafers** with deep trenches in semiconductor **device** fabrication
INVENTOR(S): Lee, Kuei-Ying; Tao, Hun-Jan; Tsai, Chia-Shiung
PATENT ASSIGNEE(S): Taiwan Semiconductor Manfacturing Company, Taiwan
SOURCE: U.S., 8 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6129091	A	20001010	US 1996-725804	19961004

PRIORITY APPLN. INFO.: US 1996-725804 19961004

AB Current aq. methods for removal of polymeric materials from the sidewalls of trenches etched into silicon **wafers** by reactive-ion-etching are inadequate for treating deep trenches having high aspect ratios. Spin-dry operations performed after the aq. etching are incapable of completely removing rinse **water** and ionic species from these deep trenches, thereby leaving pockets of liq. Subsequent evapn. of these pockets results in the concn. and eventual pptn. of residual ionic species creating watermarks. A two-stage **cleaning** method is described in which the first stage dissolves the sidewall polymer and the second stage draws ionic species strongly chemisorbed onto the silicon surfaces into soln. A key feature of the method is that the **wafer** surface is not permitted to dry until after the final rinse. The method includes treating RIE etched silicon **wafer** with 1st soln. contg. hydrofluoric acid and a **surfactant**, rinsing with deionized **water**, immersing in 2nd soln. contg. **H2O2** and **NH4OH**, rinsing with deionized **water**, and then drying.

IC ICM B08B003-08
ICS B08B003-12
NCL 134003000

CC 76-3 (Electric Phenomena)
ST **cleaning** silicon **wafer** deep trench; semiconductor **device** fabrication silicon **wafer cleaning**; DRAM deep trench silicon **wafer cleaning**
IT Memory **devices**
(DRAM (dynamic random access), fabrication of; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **Cleaning**
Semiconductor **device** fabrication
(**cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT MOS **devices**
(complementary, fabrication; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT Sputtering
Sputtering
(etching, reactive, **cleaning** after; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT Washing
(rinsing; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **Surfactants**
(soln. contg.; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT Etching
Etching
(sputter, reactive, **cleaning** after; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized, for rinsing; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) 7664-39-3, Hydrofluoric acid, uses **7722-84-1, Hydrogen peroxide**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(soln. contg.; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**wafers**; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(deionized, for rinsing; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) **7722-84-1, Hydrogen peroxide**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(soln. contg.; **cleaning** of silicon **wafers** with deep trenches in semiconductor **device** fabrication)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 6 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 132:86406 HCA
TITLE: The effect of **surfactants** in **NH4OH** on silicon surfaces and particles removal
AUTHOR(S): Park, Jin-Woo; Park, Jin-Goo; Kim, Ki-Sub; Song, Hyung-Soo
CORPORATE SOURCE: Dep. Metall. Materials Eng., Hanyang Univ., Ansan, 425-791, Peop. Rep. China
SOURCE: Han'guk Chaelyo Hakhoechi (1999), 9(9), 872-877
CODEN: HCHAEU; ISSN: 1225-0562
PUBLISHER: Materials Research Society of Korea
DOCUMENT TYPE: Journal
LANGUAGE: Korean
AB The purpose of this research was to study the characteristics and the **cleaning** efficiency of **NH4OH** solns. added with **H2O2** and **surfactants**. **NH4OH** solns. added with **surfactants** did not show much changes in pH and redox potential (Eh) as a function of **NH4OH** concn. compared with **NH4OH** increased. The decrease of surface tension from 72 dynes/cm to 38 dynes/cm was obsd. in solns. added with **surfactant** but not in **H2O2** and **surfactant** added NH2OH solns. SC1(**NH4OH:H2O** = 1:1:5) soln. removed the PSL particles (0. 67.mu.m in diam.) on Si **wafers** effectively at all temps. studied. **NH4OH** soln. added with a **surfactant** could not remove particles at room temp., however it was possible to remove particles at higher temps., 50.degree. and 80.degree..
CC 76-3 (Electric Phenomena)
ST **surfactant** ammonia **cleaning** silicon
IT **Cleaning**
Surface tension
Surfactants
(effect of **surfactants** in **ammonium hydroxide** on silicon surfaces and particles removal)
IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(effect of **surfactants** in **ammonium hydroxide** on silicon surfaces and particles removal)
IT 9003-53-6, Polystyrene
RL: REM (Removal or disposal); PROC (Process)
(effect of **surfactants** in **ammonium hydroxide** on silicon surfaces and particles removal)
IT **1336-21-6, Ammonium hydroxide ((NH4)(OH)) 7722-84-1, Hydrogen peroxide**, uses 119978-24-4, NCW601A
RL: TEM (Technical or engineered material use); USES (Uses)
(effect of **surfactants** in **ammonium hydroxide** on silicon surfaces and particles removal)
IT **1336-21-6, Ammonium hydroxide ((NH4)(OH)) 7722-84-1, Hydrogen peroxide**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(effect of **surfactants** in **ammonium hydroxide** on silicon surfaces and particles removal)

L36 ANSWER 7 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 127:178012 HCA
TITLE: Semiconductor **wafer cleaning** system
INVENTOR(S): Olesen, Michael B.; Bran, Mario E.

PATENT ASSIGNEE(S): Verteq, Inc., USA
SOURCE: U.S., 25 pp., Cont.-in-part of U.S. Ser. No. 140,290, abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5656097	A	19970812	US 1994-361139	19941221
US 5908509	A	19990601	US 1997-908330	19970807
US 5996595	A	19991207	US 1997-908345	19970807
US 6158445	A	20001212	US 1999-358568	19990720
US 6378534	B1	20020430	US 2000-694938	20001023

PRIORITY APPLN. INFO.:
US 1993-140290 B2 19931020
US 1994-361139 A3 19941221
US 1997-910033 A3 19970811
US 1999-358568 A1 19990720

AB Semiconductor **wafers** are positioned in a single **cleaning** tank and subjected to sequential flows of .gtoreq.1 highly dild. **cleaning** solns. that are injected from the lower end of the tank and allowed to overflow at the upper end, followed by rinse **water** after the dil. **cleaning** soln. is dumped. One soln. contains 1 part **NH4OH**, 2 parts **H2O2**, and 300-600 parts deionized **H2O**, and a trace of high purity **surfactant**. A second soln. contains highly dil. HF. A third soln. of **H2O2** is more dil. than the first soln. A fourth soln. contains HCl greatly dild. with deionized **H2O**. Quick dump valves in the tank bottom enable the solns. to be quickly dumped followed by .gtoreq.1 rinse steps, including a quick refill while spraying and then dumping of the rinsing **H2O**. **Cleaning** is assisted by application of megasonic energy.

IC ICM B08B003-08
ICS B08B003-12; B08B007-02; C23G001-02
NCL 134001000
CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 76
ST **cleaning** solvent semiconductor **wafer**; **ammonium hydroxide cleaning** solvent; hydrofluoric acid **cleaning** solvent; hydrochloric acid **cleaning** solvent; **hydrogen peroxide cleaning** solvent; sonic vibration **cleaning** semiconductor **wafer**
IT **Cleaning**
(megasonic; semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
IT **Cleaning** solvents
(semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
IT Semiconductor materials
(**wafer**; semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)
IT **1336-21-6**, **Ammonium hydroxide** ((**NH4**)(**OH**)) 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses **7722-84-1**, **Hydrogen peroxide**, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)

IT **1336-21-6, Ammonium hydroxide ((NH4)(OH)) 7722-84-1, Hydrogen peroxide**, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(semiconductor **wafer cleaning** system using multiple flows of very dil. solvents and sonication)

L36 ANSWER 8 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 125:46159 HCA
TITLE: Proposal of advanced wet **cleaning** of silicon surface
AUTHOR(S): Ohmi, Tadahiro
CORPORATE SOURCE: Dep. Electron., Tohoku Univ., Sendai, 980, Japan
SOURCE: Proceedings - Electrochemical Society (1996), 95-20(Cleaning Technology in Semiconductor Device Manufacturing), 1-12
CODEN: PESODO; ISSN: 0161-6374
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Ultraclean **wafer** surface is crucial for high quality processing in Si technologies. **Cleaning** of Si **wafer** surface was provided by RCA wet **cleaning** for this quarter century, where there exist high temp. processes consisting of H2SO4/**H2O2**/**H2O**, **NH4OH**/**H2O2**/**H2O** and HCl/**H2O2**/**H2O** treatment. Thus, RCA **cleaning** requires a large no. of processing steps, resulting in requirements of huge consumption vol. of liq. chems. and ultrapure **H2O**, and simultaneously huge vol. of **clean** air exhaust to suppress chem. vapor getting into **clean** room. Total room temp. wet **cleaning** consisting of five **cleaning** steps was developed for Si **wafer** surface, where consumption vol. of liq. chems. and ultrapure **H2O** was reduced dramatically <1/20 compared to that of RCA **cleaning**. The newly developed **cleaning** technol. was confirmed to contribute to future simplified and low cost manufg. of ULSI.

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 48, 66, 67

ST **cleaning** silicon distd **water** hydrogen fluoride

IT Semiconductor **devices**
Sound and Ultrasound
Surfactants
(five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT Particles
(removal of; five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT 7664-39-3, Hydrogen fluoride, processes **7722-84-1**, **Hydrogen peroxide**, processes **7732-18-5**, **Water**, processes 10028-15-6, Ozone, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(five-step wet-**cleaning** process for silicon **wafers** with low consumption of liq. chems. and ultrapure **water**)

IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(five-step wet-**cleaning** process for silicon **wafers**

with low consumption of liq. chems. and ultrapure **water**)
IT 7440-22-4, Silver, processes 7440-50-8, Copper, processes
RL: REM (Removal or disposal); PROC (Process)
(five-step wet-**cleaning** process for silicon **wafers**
with low consumption of liq. chems. and ultrapure **water**)
IT **7722-84-1, Hydrogen peroxide**, processes
7732-18-5, Water, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(five-step wet-**cleaning** process for silicon **wafers**
with low consumption of liq. chems. and ultrapure **water**)

L36 ANSWER 9 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 124:264105 HCA
TITLE: **Cleaning** of semiconductor **devices**
INVENTOR(S): Kawahara, Hiroyuki
PATENT ASSIGNEE(S): Matsushita Electronics Corp, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 08017775	A2	19960119	JP 1994-146266	19940628
PRIORITY APPLN. INFO.:			JP 1994-146266	19940628

AB Solns. for **cleaning** at 65-75.degree. contain 0.6-1.5% **NH4OH**, 2-2.5% **H2O2**, and **H2O**.
IC ICM H01L021-304
ICS C11D007-04; C11D007-06; C11D007-18; H01L021-308
CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 76
ST **cleaning** silicon **wafer**; **ammonium hydroxide cleaning** soln; **hydrogen peroxide cleaning** soln
IT Semiconductor **devices**
(silicon **wafers**; **cleaning** solns. contg. **ammonium hydroxide** and **hydrogen peroxide** for semiconductor **devices**)
IT **Detergents**
(**cleaning** compns., **cleaning** solns. contg. **ammonium hydroxide** and **hydrogen peroxide** for semiconductor **devices**)
IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) **7722-84-1, Hydrogen peroxide**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**cleaning** solns. contg. **ammonium hydroxide** and **hydrogen peroxide** for semiconductor **devices**)
IT 7440-21-3, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(**wafers**; **cleaning** solns. contg. **ammonium hydroxide** and **hydrogen peroxide** for semiconductor **devices**)
IT **1336-21-6, Ammonium hydroxide** ((**NH4**)(**OH**)) **7722-84-1, Hydrogen peroxide**, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(**cleaning** solns. contg. **ammonium hydroxide** and **hydrogen peroxide** for semiconductor **devices**)

L36 ANSWER 10 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 122:202039 HCA
TITLE: The wet process technology in the semiconductor manufacturing process. Advanced wet **cleaning** technology
AUTHOR(S): Ohmi, Tadahiro
CORPORATE SOURCE: Fac. Eng., Tohoku Univ., Sendai, 980-77, Japan
SOURCE: Denki Kagaku oyobi Kogyo Butsuri Kagaku (1995), 63(3), 184-8
CODEN: DKOKAZ; ISSN: 0366-9297
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Japanese
AB A review, with 6 refs., on **cleaning** of silicon **wafers** with **NH4OH-H2O2-H2O-surfactant** or O3-contg. pure **water**.
CC 76-0 (Electric Phenomena)
ST review silicon **wafer cleaning** semiconductor
IT Semiconductor **devices**
Surfactants
(**cleaning** of silicon **wafer** in manuf. of semiconductor **device**)
IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**cleaning** of silicon **wafer** in manuf. of semiconductor **device**)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
10028-15-6, Ozone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** of silicon **wafer** in manuf. of semiconductor **device**)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** of silicon **wafer** in manuf. of semiconductor **device**)

L36 ANSWER 11 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 121:159790 HCA
TITLE: Dilute ammonia-**hydrogen peroxide** solution **detergents** for particle removal from **wafers**
INVENTOR(S): Kokubu, Katsunori
PATENT ASSIGNEE(S): Sony Corp, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06112179	A2	19940422	JP 1992-261270	19920930

PRIORITY APPLN. INFO.: JP 1992-261270 19920930

AB The title **detergents** contain **ammonium hydroxide**, aq. **hydrogen peroxide**, and pure **water** with the pure **water** content 20-100 times the overall vol. of **ammonium hydroxide** and aq. **hydrogen peroxide**.

IC ICM H01L021-304
ICS C11D007-18

CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 76

ST particle removal **wafer ammonium hydroxide**; **hydrogen peroxide** particle removal **wafer**

IT Semiconductor **devices**
(manuf. of, **wafer cleaning** in, dil. ammonia-**hydrogen peroxide** for)

IT **Detergents**
(**cleaning** compns., dil. ammonia-**hydrogen peroxide**, for particle removal from **wafers**)

IT **7722-84-1, Hydrogen peroxide**, uses
RL: USES (Uses)
(dil. soln. contg. **ammonium hydroxide** and, for particle removal from **wafers**)

IT **1336-21-6, Ammonium hydroxide**
RL: USES (Uses)
(dil. soln. contg. **hydrogen peroxide** and, for particle removal from **wafers**)

IT 7440-21-3, Silicon, uses
RL: USES (Uses)
(**wafer**, particle removal from, dil. ammonia-**hydrogen peroxide** solns. for)

IT **7722-84-1, Hydrogen peroxide**, uses
RL: USES (Uses)
(dil. soln. contg. **ammonium hydroxide** and, for particle removal from **wafers**)

IT **1336-21-6, Ammonium hydroxide**
RL: USES (Uses)
(dil. soln. contg. **hydrogen peroxide** and, for particle removal from **wafers**)

L36 ANSWER 12 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 120:336073 HCA
TITLE: Improved wet chemical **cleaning** for realization of ultraclean **wafer** surface
AUTHOR(S): Ohmi, Tadahiro; Imaoka, Takashi; Takano, Jun; Kunimoto, Fumitomo
CORPORATE SOURCE: Dep. Elec., Tohoku Univ., Sendai, 980, Japan
SOURCE: Particulate Science and Technology (1993), 11(3-4), 229-43
CODEN: PTCHDS; ISSN: 0272-6351
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The improved wet **cleaning** process is described.. Several new technologies are incorporated in this process. The ozone-added ultrapure **water** rinsing technol. (O3-**H2O**) has made it possible to completely remove trace org. mols. adsorbed on the **wafer** surface at room temp. The optimal compn. of the **NH4OH-H2O2-H2O** soln. has been found to maximize the particle removal efficiency without increasing surface microroughness at all. The DHF-**H2O2 cleaning** technol. is very effective in removing metals such as Cu that take electrons from Si to directly bind with the Si

surface. This **cleaning** technol. is also effective in removing native oxide. The technol. to terminate the Si surface with hydrogen is also employed. Hot ultrapure **water** is used for this purpose.

CC 76-3 (Electric Phenomena)

ST silicon **wafer cleaning** ammonia hydrofluoric acid; **hydrogen peroxide** copper impurity **cleaning**; diode breakdown silicon **cleaning** ozone

IT Electric breakdown
(of silicon, wet **cleaning** process effect on)

IT **Surfactants**
(removal of, from silicon, wet **cleaning** process for)

IT Diodes
(silicon-based, characteristics of, wet **cleaning** process effect on)

IT Electric resistance
(contact, of aluminum on silicon, wet **cleaning** process effect on)

IT 7429-90-5, Aluminum, properties
RL: PRP (Properties)
(contact resistance of, on silicon, wet **cleaning** process effect on)

IT 7440-50-8, Copper, miscellaneous
RL: MSC (Miscellaneous)
(removal of impurities of, from silicon surface, wet **cleaning** process for)

IT 7440-21-3, Silicon, uses
RL: USES (Uses)
(wet chem. process of **cleaning** of, diode characteristics in relation to)

IT 7727-37-9, Nitrogen, uses
RL: USES (Uses)
(wet **cleaning** process of silicon **wafers** sealed under)

IT 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-41-7, Ammonia, uses **7722-84-1, Hydrogen peroxide**, uses 10028-15-6, Ozone, uses
RL: USES (Uses)
(wet **cleaning** using, of silicon surface, diode breakdown in relation to)

IT **7722-84-1, Hydrogen peroxide**, uses
RL: USES (Uses)
(wet **cleaning** using, of silicon surface, diode breakdown in relation to)

L36 ANSWER 13 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 118:203330 HCA

TITLE: Segregation and removal of metallic impurity at interface of silicon and fluorine etchant

AUTHOR(S): Ohmi, Tadahiro; Imaoka, Takashi; Kezuka, Takehiko; Takano, Jun; Kogure, Masahiko

CORPORATE SOURCE: Dep. Electron., Tohoku Univ., Sendai, 980, Japan

SOURCE: Journal of the Electrochemical Society (1993), 140(3), 811-18
CODEN: JESOAN; ISSN: 0013-4651

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The segregation and removal of metallic impurities were studied at the solid/liq. interface between chems. and various Si **wafer** surfaces (p, n, p, n+). Several ilmpurities employed in the process were studied for the removal of oxide from Si surface. Metals featuring high

electronegativity (such as Cu) are directly adsorbed on the bare Si surface while taking electrons away from the Si surface. These metals are hard to remove. Cu was used as the representative of metals to be directly adsorbed on the bare Si surface and studied its segregation and removal at the solid/liq. interface between Si **wafer** and impurities to keep the Si surface bare such as DHF, DHF-**H2O2**, and BHF. Cu ion in DHF adheres on every Si **wafer** surface that were used in the study (p, n, p+, n+), esp. on the n+-Si surface. The DHF-**H2O2** soln. is effective in removing metals featuring high electronegativity such as Cu from the p-Si and n-Si **wafers**. Even when the DHF-**H2O2** soln. has Cu ions at the concn. of 1 ppm, this soln. is effective in **cleaning** the **wafer**. In the case of the n+-Si and p+-Si **wafers**, however, their surfaces get contaminated with Cu when Cu ion of 10 ppb remains in the DHF-**H2O2** soln. When BHF is used, Cu in BHF is more likely to contaminate the p-Si, n-Si, and p+-Si **wafers** but is less likely to contaminate the n+-Si **wafer**. The **surfactant** added to BHF to improve its wettability onto the Si **wafer** is effective in preventing Cu pptn. onto the p-Si, n-Si, and p+-Si **wafers**. This effect of the **surfactant**, however, is not obsd. on the n+-Si **wafer**. The surface microroughness on the n+-Si **wafer** is increased when it is immersed in the DHF-**H2O2** soln. for 10 min. The etch rate of DHF-**H2O2** and BHF on the n+-Si **wafer** is much higher than that on the other Si **wafers**. To suppress the metallic contamination on every type of Si surface <1 .times. 1010 atom/cm2, the metallic concn. in ultrapure **H2O** and high-purity DHF which is employed at the final stage of the **cleaning** process must be lowered below the part per trillionlevel. DHF-**H2O2** **cleaning** is effective in removing metallic impurities on the p and n surfaces which are required to feature extremely high **cleanliness** level, such as the **wafer** surface before gate oxidn. The DHF-**H2O2** soln., however, degrades surface roughness on the **substrate** with the n+ and p+ surfaces. To remove metallic impurities on these surfaces, there is no choice at present but to use the **NH4OH-H2O2-H2O cleaning** and the HCl-**H2O2-H2O cleaning**.

CC 76-14 (Electric Phenomena)
Section cross-reference(s): 66, 67

ST copper impurity segregation removal silicon interface; metallic impurity segregation silicon interface etchant; silicon **wafer** **cleaning** DHF peroxide soln

IT **1336-21-6, Ammonium hydroxide**
RL: USES (Uses)
(segregation and removal of metallic impurity from interface of silicon with, in **cleaning** process)

IT 7664-39-3, Hydrofluoric acid, properties **7722-84-1, Hydrogen peroxide**, properties
RL: PRP (Properties)
(segregation and removal of metallic impurity from interface of silicon with, in **cleaning** process)

IT **1336-21-6, Ammonium hydroxide**
RL: USES (Uses)
(segregation and removal of metallic impurity from interface of silicon with, in **cleaning** process)

IT **7722-84-1, Hydrogen peroxide**, properties
RL: PRP (Properties)
(segregation and removal of metallic impurity from interface of silicon with, in **cleaning** process)

L36 ANSWER 14 OF 15 HCA COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 115:292796 HCA
TITLE: Preventing metallic contamination of semiconductor **devices**
INVENTOR(S): Tateno, Toshio; Kawasawa, Yoshio; Okada, Tomokatsu
PATENT ASSIGNEE(S): Morita Kagaku Kogyo Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 03053083	A2	19910307	JP 1989-189518	19890720

PRIORITY APPLN. INFO.: JP 1989-189518 19890720

AB The process uses a mixed aq. soln. from .gtoreq.2 of HF, aq. NH4F, H2O4, **NH4OH**, H2SO4, HCl, HNO3, alc., and pure **H2O**, for **cleaning** semiconductor **devices** or for etching, which contains a 1-50-ppm anionic **surfactant**(s) from CxHyCOOH, CxHySO3H, CxFyCOOH, CxFySO3H, (x = 4-7 integer; and y = 9-15 integer), or its salt.

IC ICM C23F001-24
ICS H01L021-304; H01L021-308

CC 76-3 (Electric Phenomena)

ST semiconductor **device** metallic contamination prevention

IT Alcohols, uses and miscellaneous
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aq. solns. of, contg. **surfactants** for preventing metallic contamination of semiconductor **devices**)

IT Semiconductor **devices**
(metallic-contamination prevention of, aq. solns. contg. anionic **surfactants** for)

IT **Surfactants**
(anionic, aq. solns. contg., for preventing metallic contamination of semiconductor **devices**)

IT 111-14-8, Heptanoic acid 307-24-4 375-85-9 60586-80-3, 1-Heptanesulfonic acid
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aq. solns. contg., for preventing metallic-contamination of semiconductor **devices**)

IT 7647-01-0, Hydrochloric acid, uses and miscellaneous 7664-39-3, Hydrofluoric acid, uses and miscellaneous 7664-41-7, Ammonia, uses and miscellaneous 7664-93-9, Sulfuric acid, uses and miscellaneous 7697-37-2, Nitric acid, uses and miscellaneous **7722-84-1**, **Hydrogen peroxide**, uses and miscellaneous 12125-01-8, Ammonium fluoride (NH4F)
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aq. solns. of, contg. **surfactants** for preventing metallic contamination of semiconductor **devices**)

IT **7732-18-5, Water**, uses and miscellaneous
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**surfactant**-contg., for preventing metallic contamination of semiconductor **devices**)

IT **7722-84-1, Hydrogen peroxide**, uses and miscellaneous

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aq. solns. of, contg. **surfactants** for preventing metallic contamination of semiconductor **devices**)

IT **7732-18-5, Water**, uses and miscellaneous
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**surfactant**-contg., for preventing metallic contamination of semiconductor **devices**)

L36 ANSWER 15 OF 15 HCA COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 72:84930 HCA
TITLE: Chromium patterns by photogravure
INVENTOR(S): Cashau, George R.; George, James W.
PATENT ASSIGNEE(S): Western Electric Co., Inc.
SOURCE: Fr., 7 pp.
CODEN: FRXXAK
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 1576139	A	19690725	FR 1968-1576139	19680805
US 3542612	A	19701124	US 1967-659896	19670811

PRIORITY APPLN. INFO.: US 1967-659896 19670811

AB For practically pinhole-free, long-lasting patterns for high precision work, such as semiconductor **devices** and integrated circuits, soda-lime glass is boiled in an inorg. caustic **detergent**, then in **H2O2**, rinsed with deionized **water**, and dried 30 min at 120.degree.. A 50-nm layer of Cr is vacuum-deposited and blown with an air jet (4.22 kg/cm2) to remove any loose Cr. The loosened Cr particles are believed to carry with them the impurities on the glass surface interfering with the adhesion of the metal,so that a 2nd 50-nm Cr coating results in a pinhole-free layer of Cr. A photoresist is applied and the bared Cr etched with H2SO4-H3PO4. The etch action is stopped by immersion in **NH4OH**, the resist removed, and the Cr pattern **cleaned** with NaOH.

IC G03F
CC 74 (Radiation Chemistry, Photochemistry, and Photographic Processes)

=> d L41 1-11 cbib abs hitind hitrn

L41 ANSWER 1 OF 11 HCA COPYRIGHT 2003 ACS on STN
132:323339 Textile spot and stain remover composition and preparation therefor. Whiteley, Reginald Keith; Whiteley, Bruce Alan (Australia). Pat. Specif. (Aust.) AU 711246 B2 **19991007**, 25 pp. (English). CODEN: ALXXAP. APPLICATION: AU 1995-20140 19950518. PRIORITY: AU 1994-5759 19940523.

AB The heavy duty spot and stain remover of the present invention is an aq. **cleansing** compn. comprising: (a) an anionic or nonionic **surfactant** suitable for use on dyed textile fibers, in an amt. of from 0.05-2.5 wt.% of the compn.; (b) a polar solvent or mixt. of solvents comprising a glycol contg. 5 to 13 carbon atoms and/or an alc. contg. 6 or more carbon atoms; (c) an effective quantity of active peroxyhydrate oxidizing agent, suitable for use on dyed textile fibers; (d) a transition metal present in the form of an aq. ammonium complex in an amt. of 2.5-200 ppm of metal; (e) a **water** sol. resin selected from the group

consisting of styrene maleic anhydrides, styrene acrylic anhydrides, polyacrylic resins, and derivs. thereof in an amt. of 0.10-5.0 wt.% of dry resin in the compn.; and (f) sufficient **ammonium hydroxide** to raise the pH of the soln. to between 7.0 and 12.5. The **cleansing** compn. provides a simple and effective improvement on current methods of removing spots and stains from textile fabrics.

IC ICM C11D001-14
ICS C11D001-66; C11D001-83; C11D003-44; C11D003-39; C11D003-37

CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 43

ST textile stain spot **cleansing** compn prepn; **surfactant** solvent oxidant metal ammonia **cleaner**

IT **Surfactants**
(anionic, sodium laurylsulfate; prepn. of textile spot and stain remover comprising)

IT **Surfactants**
(nonionic; prepn. of textile spot and stain remover comprising)

IT **Detergents**
(stain removers; prepn. of textile spot and stain remover)

IT Polymers, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**water**-sol., SMA 17352; prepn. of textile spot and stain remover comprising)

IT 151-21-3, Sodium lauryl sulphate, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(anionic **surfactant**; prepn. of textile spot and stain remover comprising)

IT 1313-60-6, Sodium peroxide 3313-92-6, Sodium percarbonate **7722-84-1, Hydrogen peroxide**, uses 7775-27-1, Sodium persulfate 15630-89-4 18278-90-5, Sodium peroxydiphosphate
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(oxidant; prepn. of textile spot and stain remover comprising)

IT 60800-81-9, SMA 17352
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**water**-sol. polymer; prepn. of textile spot and stain remover comprising)

IT **7722-84-1, Hydrogen peroxide**, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(oxidant; prepn. of textile spot and stain remover comprising)

L41 ANSWER 2 OF 11 HCA COPYRIGHT 2003 ACS on STN
127:102570 Particle deposition and removal in wet **cleaning** processes for semiconductor manufacturing. Itano, M.; Kezuka, T.; Kubo, M.; Ohmi, T. (DAIKIN INDUSTRIES LTD., Settsu, Japan). Semiconductor Pure Water and Chemicals Conference, 15th(UPW & Chemical Proceedings, 1996), 257-287 (English) **1996**. CODEN: SPWCFI. Publisher: Balazs Analytical Laboratory.

AB It is demonstrated that the room temp. **NH4OH-H2O2-H2O** soln. has almost the same ability to remove particles as the high temp. **NH4OH-H2O2-H2O** soln. This was achieved by increasing the **NH4OH** content in the **NH4OH-H2O2-H2O** to around the ratio of 2:1:5 to 10:1:5. In addn., the dild. HF soln. with an anionic **surfactant** is essentials to maintain sufficient particle removal efficiency in the room

temp. **NH4OH-H2O2-H2O cleaning** process.
CC 76-3 (Electric Phenomena)
ST particle removal wet **cleaning** semiconductor manufg; **ammonium hydroxide** wet **cleaning** semiconductor manufg; **hydrogen peroxide** wet **cleaning** semiconductor manufg
IT **Cleaning**
Particles
Semiconductor materials
(particle deposition and removal in wet **cleaning** with **NH4OH-H2O2-H2O** soln. for semiconductor manufg.)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(particle deposition and removal in wet **cleaning** with **NH4OH-H2O2-H2O** soln. for semiconductor manufg.)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(particle deposition and removal in wet **cleaning** with **NH4OH-H2O2-H2O** soln. for semiconductor manufg.)

L41 ANSWER 3 OF 11 HCA COPYRIGHT 2003 ACS on STN
123:290419 SC-1 **cleaning** with low surface-tension ammonia **water**. Mori, Kiyota; Ishikawa, Norio; Shihoya, Takao; Yamashita, Asaaki (Kanto Chemical Co., Inc., Japan). Semiconductor Pure Water and Chemicals Conference, 12th, 122-43 (English) **1993**. CODEN: SPWCFI. ISSN: 1521-4656.
AB A discussion of effectiveness of **cleaning** solns. contg. ammonia **water**, **H2O2**, and deionized **water**; the soln. is used to remove dust, polystyrene latex, and silica.
CC 46-3 (Surface Active Agents and Detergents)
ST ammonia **hydrogen peroxide cleaning** soln
IT **Detergents**
(**cleaning** compns., effectiveness of SC-1 **cleaning** soln. contg. ammonia **water** and **hydrogen peroxide**)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(effectiveness of SC-1 **cleaning** soln. contg. ammonia **water** and **hydrogen peroxide**)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(effectiveness of SC-1 **cleaning** soln. contg. ammonia **water** and **hydrogen peroxide**)

L41 ANSWER 4 OF 11 HCA COPYRIGHT 2003 ACS on STN
116:217395 .eta.leanings of silicon plates. Jankech, Dominik; Haban, Ivan; Drgac, Lubomir (Czech.). Czech. CS 270880 B1 **19910704**, 2 pp. (Slovak). CODEN: CZXXA9. APPLICATION: CS 1988-8807 19881227.
AB Si plates are **cleaned** by covering with a soln. consisting of deionized **water** 4-7, **NH4OH** 1, **H2O2** 1 part, and **surfactant** 0.01-4 wt.%, and subsequent exposure to ultrasound at 0.2-1.2 MHz. The **cleaning** procedure is rapid and

provides complete removal of chem. and mech. impurities. Typically, a soln. consisting of deionized **water** 5, **NH4OH** 1, **H2O2** 1 part, and **surfactant** 0.1% is used with ultrasound at 0.7 MHz.

IC ICM C23G005-00
CC 49-1 (Industrial Inorganic Chemicals)
ST silicon plate **cleaning** soln ultrasound
IT Sound and Ultrasound
(**cleaning** by, of silicon plates covered by treatment soln.)
IT **Surfactants**
(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)
IT 7440-21-3, Silicon, uses
RL: USES (Uses)
(**cleaning** of plates of, soln. and ultrasonic treatment for)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: USES (Uses)
(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)
IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: USES (Uses)
(**cleaning** soln. contg., for ultrasonic treatment of silicon plates)

L41 ANSWER 5 OF 11 HCA COPYRIGHT 2003 ACS on STN
113:134693 Manufacture of alkaline salts of maleic anhydride copolymers.. Klopotek, Alojzy; Jaroszewska, Maria (Instytut Chemii Przemyslowej, Pol.). Pol. PL 145180 B1 **19880831**, 9 pp. Abstracted and indexed from the unexamined application. (Polish). CODEN: POXXA7. APPLICATION: PL 1984-249200 19840815.

AB Prepn. of the title salts involves (1) copolymg. in a **water**-sol. solvent in the presence of 0.5-5 wt.% **H2O2** initiator at 35-80.degree. and moleic anhydride (I)/vinyl monomer mol ratio of 1:(1-50) and (2) treating the copolymers (or their 10-40% solns.) with an alkali metal hydroxide, **NH4OH**, or ethanolamine. Thus, a mixt. of acetone 100 mL, styrene 1.38 x 10-1 mol, I 1.38 x 10-1 mol, and **H2O2** 2.5 x 10-2 mol was boiled 3 h at 56.1.degree.. After copolymn., the mixt. was cooled to 20-25.degree., the copolymer was dild. with acetone at 1:3 ration, and poured into **water** at 15.degree. and copolymer-**water** wt. ratio 1:5. The ppt. was sepd. by filtration, washed with **H2O**, and dried to give 27 g maleic anhydride-styrene copolymer (acid no. 554) at a yield of 97%. The powd. copolymer was contacted with 10.684 g NaOH (in the form of 10% soln.) at 70.degree. to obtain 26.3 wt% soln of Na salt, which was dried to give 35 g solid (yield 99%).

IC ICM C08F222-08
ICS C08F212-08
CC 46-6 (Surface Active Agents and Detergents)
Section cross-reference(s): 35
ST maleic anhydride copolymer alk salt; styrene maleic salt copolymer; **cleaning** maleic salt copolymer
IT **Detergents**
(**cleaning** compns., maleic anhydride-vinyl compd. copolymer salts for, prepn. of)
IT 25736-61-2P, Maleic anhydride-styrene copolymer sodium salt 52002-63-8P 98202-34-7P 129426-96-6P
RL: IMF (Industrial manufacture); PREP (Preparation)
(prepn. of, for washing and **cleaning** agents)

L41 ANSWER 6 OF 11 HCA COPYRIGHT 2003 ACS on STN
112:201177 Carpet **cleaning** composition containing alcohol and peroxyhydrate. Minns, Charles Randolph (BASF Corp., USA). Eur. Pat. Appl. EP 346835 A2 **19891220**, 6 pp. DESIGNATED STATES: R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1989-110696 19890613. PRIORITY: US 1988-206531 19880614.

AB Aq. **cleaning** compns. contg. a C1-5 alc. and a peroxyhydrate such as **H2O2** and having pH 7-12 are useful for removing soils and/or stains, esp. coffee stains, from synthetic polymer fibers, esp. carpet fibers. A mixt. of iso-PrOH 10, 30% aq. **H2O2** 30, **water** 50, and **NH4OH** 10% was sprayed on nylon, polyester, and polypropene carpets contg. black coffee stains and allowed to stand 1 h, giving complete stain removal.

IC ICM C11D003-00
ICS C11D007-50; C11D007-38; C11D007-06

CC 46-6 (Surface Active Agents and Detergents)

ST alc stain remover carpet; peroxide stain remover carpet; **cleaner** alc peroxide carpet; coffee stain remover carpet; nylon carpet stain remover; polyester carpet stain remover; polypropene carpet stain remover; isopropyl alc stain remover carpet; bleaching peroxide stain carpet

IT Carpets
(**cleaners** contg. alc. and peroxyhydrate for stained)

IT Peroxides, uses and miscellaneous
RL: USES (Uses)
(**cleaners** contg. alcs. and, for stained carpets)

IT Bleaching agents
(peroxide, **cleaners** contg. alcs. and, for stained carpets)

IT Alcohols, uses and miscellaneous
RL: USES (Uses)
(C1-5, **cleaners** contg. peroxide and, for stained carpets)

IT **Detergents**
(**cleaning** compns., alc.- and peroxide-contg., for stained carpets)

IT 124-43-6 1313-60-6, Sodium peroxide (Na2(O2)) 7775-27-1, Sodium persulfate 10332-33-9, Sodium perborate monohydrate 10486-00-7, Sodium perborate tetrahydrate 15593-49-4, Potassium peroxydiphosphate 15630-89-4, Sodium percarbonate 17014-71-0, Potassium peroxide 18278-90-5, Sodium peroxydiphosphate 66904-11-8 127030-48-2
RL: USES (Uses)
(**cleaners** contg. alcs. and, for stained carpets)

IT 64-17-5, Ethanol, uses and miscellaneous 67-56-1, Methanol, uses and miscellaneous 67-63-0, 2-Propanol, uses and miscellaneous 71-23-8, 1-Propanol, uses and miscellaneous 71-36-3, 1-Butanol, uses and miscellaneous 75-85-4, tert-Pentyl alcohol 78-83-1, Isobutyl alcohol, uses and miscellaneous 78-92-2, 2-Butanol
RL: USES (Uses)
(**cleaners** contg. peroxide and, for stained carpets)

L41 ANSWER 7 OF 11 HCA COPYRIGHT 2003 ACS on STN
74:44879 Compositions for **cleaning** and removing copper from metallic surfaces. Moeller, Fritz; Groschopp, Heinz; Wagenknecht, Rudolf (Collardin, Gerhard, G.m.b.H.). Ger. DE 1289720 **19690220**, 4 pp. (German). CODEN: GWXXAW. APPLICATION: DE 1964-H51404 19640116.

AB Gun bores are **cleaned** with a compn. consisting preferably of 800 cm3 NH3 soln. (25%), 100 g melamine perhydrate (20% **H2O2**), 8 g CM-cellulose, and 200 cm3 **H2O** with a **wetting agent**. Simultaneous removal of Cu and gun powder residues without base metal attack and pollution problems is claimed.

IC C23G
CC 56 (Nonferrous Metals and Alloys)
ST **cleaning** copper stripping solns; copper stripping **cleaning** solns; stripping copper **cleaning** solns; ammonia **cleaning** copper stripping solns; peroxides **cleaning** copper stripping solns; melamine perhydrate copper stripping **cleaning**; perhydrate melamine copper stripping **cleaning**
IT 33676-69-6
RL: USES (Uses)
(**cleaning** with, of copper from gun barrels)
IT 109-89-7, uses and miscellaneous 110-86-1, uses and miscellaneous **1336-21-6** 7727-21-1 7727-54-0 9000-11-7 9004-67-5 11067-82-6
RL: USES (Uses)
(**cleaning** with, of copper, from gun barrels)
IT **1336-21-6**
RL: USES (Uses)
(**cleaning** with, of copper, from gun barrels)

L41 ANSWER 8 OF 11 HCA COPYRIGHT 2003 ACS on STN
65:2700 Original Reference No. 65:447c-d Surface preparation of magnesium molds for plastics. MacCaffray, Rex S., Jr.; Hankins, Kenneth E. (C. H. Masland & Sons). US 3248825 **19660503**, 3 pp. (Unavailable). APPLICATION: US 19640113.
AB Such molds, commonly made of an alloy contg. at least 95% Mg, are finished by chem. etching. The molds are **scrubbed** with a slurry of MgO, CaCO3, or preferably ZnO particles of .apprx.1-.mu. size or finer in an alk. soap soln. to produce a desirably uniform surface, free from shiny areas that result in blotchiness of the casting surfaces. Any cold liquid, such as **H2O** or alc., can be used, and the shiny spots are eliminated more quickly if the slurry contains 0.2-5% 50-100 .mu. hard carbide particles by wt. of solids. The application can be made with a small **scrubbing** brush, preferably nylon, using 5-15 lb. pressure. Phosphate **detergents** should not be used, ordinary laundry soap being preferable.
NCL 051281000
CC 20 (Nonferrous Metals and Alloys)
IT **1336-21-6, Ammonium hydroxide**
(in etching soln. for Ag and Ag alloys)
IT **7722-84-1, Hydrogen peroxide**
(in etching solns. for Ag and Ag alloys)
IT **1336-21-6, Ammonium hydroxide**
(in etching soln. for Ag and Ag alloys)
IT **7722-84-1, Hydrogen peroxide**
(in etching solns. for Ag and Ag alloys)

L41 ANSWER 9 OF 11 HCA COPYRIGHT 2003 ACS on STN
53:69980 Original Reference No. 53:12695c-e Copolymers of vinyl lactams and trimethallyl isocyanurate. Davis, Clyde W.; Ehlers, Forrest A. (Dow Chemical Co.). US 2848440 **19580819** (Unavailable). APPLICATION: US .
AB Dye-receptive, **water**-insol. copolymers of vinylpyrrolidinone (I) and trimethallyl isocyanurate (II) were prepd. by dissolving 20.0 g. I and 2.0 g. II in 45 ml. **water**, contg. 0.28 ml. 28% aq. **NH4OH** and 1.8 ml. 5% aq. **H2O2**, and heating at 50.degree. for 16 hrs. without agitation. The white, gel-like product was dried in vacuo and then washed with **water** in a Soxhlet app. to recover 56.5% by wt. copolymer based on monomer charge. The **water**-insol. copolymer was ball-milled and 10% by wt. added to a polyacrylonitrile spinning soln. The resultant fibers had excellent dyeability with Calcodur Pink 2 BL.

The fiber did not lose significant amts. of the impregnated copolymer upon **scouring** in a boiling concd. aq. soln. of a **detergent**.

CC 25 (Dyes and Textiles Chemistry)

L41 ANSWER 10 OF 11 HCA COPYRIGHT 2003 ACS on STN

41:28593 Original Reference No. 41:5746c-i,5747a-c Investigation of various types of peroxides as initiators of emulsion polymerization. Yurzhenko, T. I.; Gromova, G. N.; Khaitser, V. B. Zhurnal Obshchei Khimii, 16, 1505-20 (Unavailable) **1946**. CODEN: ZOKHA4. ISSN: 0044-460X.

AB **Detns**. of the distribution between **water** and org. solvents, catalysis of the polymerization of 1,3-butadiene, stability, and effect on the properties of the polymer obtained, were made on 6 inorg. and org. peroxides: trimethylcarbinol hydroperoxide (I); dimethylethylcarbinol hydroperoxide (II); NaBO3 (9.98% active O) (III); Bz2O2 (IV); K2S2O8 (V); and **H2O2** (3-5% aq. soln.) (VI). Distribution coeffs. between **water** and C6H6, **water** and isoprene, and 1.5% aq. NaOH and isoprene, were detd. for I, III, IV, V, VI, at 25 and 60.degree.. The content of the **water**-sol. peroxides in the org. phase was almost const. with time but fell rapidly in the aq. phase, particularly at higher temp. The soly. of IV decreased with time in the org. phase, but increased in **water**; I was almost equally distributed between **water** and the org. phase at 25.degree., increasing somewhat in the latter at 60.degree.. From measurements on the rate of polymerization in the presence of an amt. of peroxide equiv. to 0.1% active O (with respect to C4H6), with a 3% soln. of Na oleate (with a 0.32 N excess Na2CO3) as **emulsifier**, phase ratio 1:1, at 60.degree., from readings of the contraction of the liquid, the order of decreasing catalytic activity was: I (depth of polymerization s = 60% reached in 8 hrs.), V (s = 60% in 26 hrs.), IV (s = 20% in 36 hrs.), III and VI (s = 0.0% in 38 hrs.). At 40.degree., only the tertiary alcs. of the I and II type were active; no polymerization occurred with any other peroxide; with I, s = 40 was attained in 10 hrs., with II in 16 hrs. From **detns**. of the rate of decompn. in both **water** and in the above 3% Na oleate soln. (IV in C6H6), the stability decreased in the order: I (unimol. rate const. k, in min., = 0.000671 at 60.degree.), V (k = 0.00125), IV (k = 0.00196), III and VI (k = 0.238 and 0.360; decompn. complete in 10-15 min. in 1-1.5% soln.). Addn. of 0.32 N Na2CO3 accelerated the rate of decompn. of VI most markedly, NaOH somewhat less, **NH4OH** least; the effect was strongly enhanced in a 3% Na oleate soln. In the same medium, the rate of decompn. of the highly stable peroxides (such as I) was much lower than the rate of polymerization; for peroxides of medium stability (such as V) decompn. was faster than polymerization, for the low-stability IV, much faster. For the least stable III and VI, polymerization of isoprene was found to lag after decompn. to such an extent that polymerization practically only started when decompn. was nearly complete; in this case the peroxides undoubtedly are only active through mol. O. In contrast, the catalytic action of peroxides of type V, characterized by the closeness of the rate curves of decompn. and polymerization, evidently is due to at. O, whereas catalysis by the highly stable tertiary alcs. (I, II) proceeds over the radicals Me3C and OOH. Variation of the concn. of I, at 40 and 50.degree., from 0.01 to 0.1% active O increased the rate of polymerization of C4H6; further increase resulted in a decrease of the rate; at 60.degree., the max. lay at 0.05% active O. Concurrently, **detns**. of the surface adsorption isotherm at 25.degree., from measurements of the surface tension, showed satn. of the surface layer of I on **water** to be attained at a concn. corresponding to 0.135% active O; hence the max. is interpreted in terms of satn. of the adsorption layer at the phase boundary. On further increasing the amt. of the peroxide, its concn. in the bulk of the aq. phase increased rapidly,

promoting rupture of reaction chains; hence the observed fall of the rate of polymerization. At const. concn. of I, the soly. of the polymer produced in C2H4Cl2 (after 24 hrs.) decreased from 77.0 to 18.1%, with s increasing from 15.2 to 73.5%. Variation of the concn. of I (0.01, 0.10, 0.15, 0.60% active O), gave s of 41.0, 40.5, 60.2 (max.), 18.6; soly. 27.0, 85.0, 100, 100; mol. wt. (Staudinger) 11,000, 23,000, 37,000 (max.), 9000, resp.; the swelling ability varied in the same way as the mol. wt. This corroborates the hypothesis of rupture of chains by the peroxide.

CC 30 (Rubber and Other Elastomers)

IT Peroxides
(as catalysts, in polymerization of butadiene and isodiene and isoprene and distribution between **water** and solvents)

IT Catalysts
(in polymerization, of butadiene and isoprene, peroxides as, and their distribution between **water** and solvents)

IT Partition
(of peroxide catalysts for polymerization between **water** and solvents)

IT Adsorption
(of peroxide catalysts on surface of **water** and solvents)

IT Sodium perborate
(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

IT 75-91-2, tert-Butyl hydroperoxide
(as catalyst in polymerization and its distribution between **water** and solvents)

IT 94-36-0, Benzoyl peroxide **7722-84-1, Hydrogen peroxide** 7727-21-1, Potassium peroxydisulfate
(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

IT 78-79-5, Isoprene
(polymerization of, with peroxide catalysts and peroxide catalyst distribution between **water** and isoprene)

IT **7722-84-1, Hydrogen peroxide**
(as catalyst in polymerization of butadiene and isoprene and distribution between **water** and solvents)

L41 ANSWER 11 OF 11 HCA COPYRIGHT 2003 ACS on STN

36:34572 Original Reference No. 36:5381a-i The estimation of small percentages of rubber in fibrous materials. Blow, C. M. India Rubber Journal, 102, 719-22 (Unavailable) **1942**. CODEN: IRJOAO. ISSN: 0367-9985.

AB Four general methods for sepg. unvulcanized or vulcanized rubber from vegetable and animal fibers are discussed, both with respect to known facts and to exptl. investigations of these methods by B. (1) the use of solvents to remove rubber without affecting the fiber (in this case the % ext. or loss in wt. is measured); (2) destruction of the fiber by a chem. reagent which does not affect the rubber; (3) oxidation, or other chem. alteration of the rubber to render it more easily removable from the fiber by extn. with a solvent or by emulsification with a **detergent**; (4) the quant. reaction of a chem. reagent with the rubber. In addn. to the conventional caustic treatment in method (2), it was found that a promising method is to treat 1-2 g. of material with boiling concd. HCl, decant through a sintered-glass or alundum crucible, agitate the slurry of degraded fiber and rubber with 50 cc. of **water** and 10 cc. of benzene, sep. the 2 layers, ppt. the rubber from the benzene by acetone, filter and weigh. A little oil-sol. dye in the benzene sometimes makes the sepn. easier. Oxidized rubber is sol. in acetone and is not included in the result. Method (3) has not been studied heretofore. Three steps are necessary: (a) treatment with an oxidation catalyst, e. g., Co or Cu

naphthenate, linoleate or stearate in CCl4 or benzene or emulsified in **NH4OH** (1-2% of catalyst by wt. of the sample); (b) oxidation of the finely divided sample by heating 1-2 hrs. in air at 70.degree. or by steeping in excess **H2O2** at 50-60.degree. for 15-30 min., filtering and evapg., and (c) sepn. of the fiber from the oxidized rubber either by removing the latter by boiling 1-2% aq. NaOH or Na2CO3, with or without Na oleate, and collecting, washing, drying and weighing the fiber, or extg. the oxidized rubber with acetone and weighing the dried residual fiber or dried ext. Ordinarily it is preferable to weigh the fiber (controlling its moisture content), since the rubber contains an indefinite percentage of O. Blank **detns.** showed that with Co linoleate and **H2O2**, cellulose loses 2% by wt. in boiling aq. NaOH. This fact is in favor of acetone extn. of the oxidized rubber. The only promising technique in method (4) seemed to be to dry the finely divided sample at 80-100.degree., immerse 1 g. in 50-100 cc. of a CCl4 soln. of Br contg. 50% more Br than the calcd. amt., add. aq. KI after 30-120 min., and titrate the liberated I with Na2S2O3. However, this procedure did not give reliable results with rubberized wool fabric. Certain general recommendations are made for sepg. rubber and fibrous materials. The sample should be finely ground or cut, and first of all extd. with acetone to remove oils, fats, waxes, org. dyes and oxidized rubber. When a soap-and-soda **scour** or NaOH treatment is included in the procedure, extn. with aq. NaOH also is necessary to remove proteins, soaps, sol. coagulants, starches, etc. In methods involving destruction of the rubber, sepn. of fiber from emulsified oxidized rubber is sometimes difficult, and it is of advantage to centrifuge the soln., wash the sepd. fiber, filter through a Gooch crucible, dry and weigh. Its purity is detd. by detg. its ash. When the oxidized rubber is estd. by acetone extn., the fiber can be filtered directly into a paper thimble. In methods involving destruction of the fiber, acetone-insol. and **water**-insol. components are detd. as rubber, and therefore the purity of the rubber should be checked by detg. its ash, and a correction for the Co or Cu salt added must be made. Typical analyses of rubberized wool yarn, leather board, rubberized cotton yarn, cellulose board and imitation leather are included.

CC 30 (Rubber and Allied Substances)

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FYI, these dates are not going to be any good for you.

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=> d L39 1-3 cbib abs hitind hitrn

L39 ANSWER 1 OF 3 HCA COPYRIGHT 2003 ACS on STN

139:172150 **Cleaning** solution for substrate surfaces and **cleaning** method. Morinaga, Hitoshi; Mochizuki, Hideaki; Ito, Atsushi (Mitsubishi Chemical Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003221600 A2 20030808, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-331915 20021115. PRIORITY: JP 2001-350947 20011116.

AB Title soln. comprise (A) **ethylene** oxide adduct type **surfactants** having **polyoxyethylene** groups and (substituted)hydrocarbon groups, (B) alkali components, (C) 0.01-4% **hydrogen peroxide**, and (D) **water**, wherein the ratio (m/n) of no. of carbon in hydrocarbon groups (m) and no. of **oxyethylene** group (n) in **polyoxyethylene** groups in **surfactants** is .ltoreq.1.5. Thus, a **cleaning** soln. with

pH 10.5 comprising 33 ppm **polyethylene** glycol monododecyl **ether** with m/n 1.1, **ammonium hydroxide**, 1.4% **hydrogen peroxide**, and **water** showed good **cleaning** against contaminated silicon wafers.

IC ICM C11D017-08
ICS B08B003-08; B08B003-10; B08B003-12; C11D001-722; C11D003-26; C11D003-39; H01L021-304

CC 76-3 (Electric Phenomena)

ST **cleaning** soln substrate surface; **polyethylene** glycol alkyl **ether hydrogen peroxide** **ammonium hydroxide** compn

IT **Cleaning**
Detergents
Surfactants
(**cleaning** soln. for substrate surfaces and **cleaning** method)

IT Alkali metal hydroxides
RL: REM (Removal or disposal); PROC (Process)
(**cleaning** soln. for substrate surfaces and **cleaning** method)

IT Quaternary ammonium compounds, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(hydroxide; **cleaning** soln. for substrate surfaces and **cleaning** method)

IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**cleaning** soln. for substrate surfaces and **cleaning** method)

IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; **cleaning** soln. for substrate surfaces and **cleaning** method)

IT 9002-92-0, **Polyethylene** glycol monododecyl **ether**
9004-95-9, **Polyethylene** glycol hexadecyl **ether**
9005-00-9, **Polyethylene** glycol octadecyl **ether**
24938-91-8, **Polyethylene** glycol tridecyl **ether**
27252-75-1, **Polyethylene** glycol octyl **ether**
RL: TEM (Technical or engineered material use); USES (Uses)
(**surfactant**; **cleaning** soln. for substrate surfaces and **cleaning** method)

IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**cleaning** soln. for substrate surfaces and **cleaning** method)

L39 ANSWER 2 OF 3 HCA COPYRIGHT 2003 ACS on STN
137:378790 Method for **cleaning** surface of substrates for display devices. Morinaga, Hitoshi; Mochizuki, Hideaki (Mitsubishi Chemical Corporation, Japan). PCT Int. Appl. WO 2002094462 A1 20021128, 39 pp.
DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR,

NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2002-JP4850 20020520. PRIORITY: JP 2001-151960 20010522.

AB A method for **cleaning** the surface of a substrate includes: (1) a step of washing the surface of a substrate with an alk. **cleaning** agent contg. a complexing agent, and (2) a step of washing the surface with a **cleaning** agent contg. HF in a content (C wt. %) of 0.03 to 3% with a washing time (t seconds) of .ltoreq.45 s, provided that C and t satisfy the relation: 0.25 .ltoreq. tC1.29 .ltoreq. 5, wherein the step (2) is carried out after the step (1). The method provides a highly efficient washing of a substrate, wherein (a) the substrate can be washed in a short time, (b) both particle contaminants and metal contaminants can be removed, and (c) the occurrence of a problem assocd. with the washing of a substrate such as re-deposition of the contaminants or the dimensional change of a processed substrate through etching is remarkably reduced.

IC ICM B08B003-08

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 74

ST **cleaning** washing surface substrate hydrogen chloride; display device substrate surface **cleaning**

IT **Cleaning**
Electrooptical imaging devices
Surfactants
Washing
(**cleaning** of substrate surface in manuf. of semiconductor devices)

IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**cleaning** of substrate surface in manuf. of semiconductor devices)

IT 60-00-4, uses 1170-02-1 **7732-18-5, Water**, uses 84677-62-3
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** of substrate surface in manuf. of semiconductor devices)

IT **1336-21-6, Ammonium hydroxide** 7664-39-3, Hydrogen fluoride, reactions **7722-84-1, Hydrogen peroxide**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**cleaning** of substrate surface in manuf. of semiconductor devices)

IT 12033-89-5, Silicon nitride, processes
RL: REM (Removal or disposal); PROC (Process)
(particle; particle removal in **cleaning** of substrate surface for semiconductor devices)

IT 1330-69-4, Dodecylbenzene sulfonate
RL: NUU (Other use, unclassified); USES (Uses)
(**surfactant; cleaning** of substrate surface for semiconductor devices)

IT 9002-92-0, **Polyethylene** glycol monododecyl **ether** 9004-98-2, **Polyethylene** glycol monooleyl **ether** 27176-87-0, Dodecylbenzenesulfonic acid
RL: NUU (Other use, unclassified); USES (Uses)
(**surfactant; cleaning** of substrate surface in manuf. of semiconductor devices)

IT **7732-18-5, Water**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**cleaning** of substrate surface in manuf. of semiconductor devices)

IT **1336-21-6, Ammonium hydroxide**
7722-84-1, Hydrogen peroxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**cleaning** of substrate surface in manuf. of semiconductor devices)

L39 ANSWER 3 OF 3 HCA COPYRIGHT 2003 ACS on STN
136:127113 Particle removal and its mechanism on hydrophobic silicon wafer in highly diluted **NH4OH** solutions with an added **surfactant**
. Park, Jin-Goo; Lee, Sang-Ho; Kim, Sang-Yong (Department of Metallurgy and Materials Engineering, Hanyang University, Ansan, 425-791, S. Korea). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 40(11), 6182-6186 (English) 2001. CODEN: JAPNDE. Publisher: Japan Society of Applied Physics.

AB Wafer **cleaning** in semiconductor processes is one of the most crit. steps because of the rapid increase in the device integration d. and its direct impact on device yield. Highly dild. **NH4OH** solns. to which a nonionic polyoxy-alkylene alkylphenyl **ether** **surfactant** was added were evaluated to measure their **cleaning** efficiency and to det. the particle removal mechanism. The particle removal expt. was performed in a 0.2 vol% **NH4OH** soln., which has a pH value equiv. to that of conventional SC1 (1:1:5, **NH4OH:H2O2:H2O** mixt.) soln., as a function of soln. temp. A **surfactant** of crit. micelle concn. of 50 ppm was added to the **NH4OH** soln. The etch rate of silicon in 0.2 vol% **NH4OH** soln. decreased to 2.4 .ANG./min from 92 .ANG./min at 80.degree. by the addn. of the **surfactant** due to the adsorption of the **surfactant** on the surface. The particle removal efficiency increased as the temp. of the solns. increased. A particle removal of over 95% was obsd. when wafers were treated in **surfactant**-added **NH4OH** soln. at 80.degree.. This can most likely be attributed to the slight increase of the etch rate and better passivation of the **surfactant** on the silicon surface at a higher temp.

CC 76-3 (Electric Phenomena)
ST semiconductor wafer **cleaning ammonium** **hydroxide**
IT Particles
Surfactants
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
IT **Cleaning**
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with an added **surfactant**)
IT **1336-21-6, Ammonium hydroxide**
RL: NUU (Other use, unclassified); USES (Uses)
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(wafers; particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)
IT **1336-21-6, Ammonium hydroxide**
RL: NUU (Other use, unclassified); USES (Uses)
(particle removal and its mechanism on hydrophobic silicon wafer in highly dild. **NH4OH** solns. with added **surfactant**)

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I didn't date limit the answers in Japio or Derwent. Derwent makes it almost impossible, it takes a very long time. Also I tried to take out duplicates, but I would imagine some duplicates remain.

****

=> file japio

FILE 'JAPIO' ENTERED AT 15:50:58 ON 24 SEP 2003
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FILE LAST UPDATED: 2 SEP 2003 <20030902/UP>
FILE COVERS APR 1973 TO MAY 30, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d L87 1-15 ibib abs ind

L87 ANSWER 1 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2002-025964 JAPIO
TITLE: METHOD OF MANUFACTURING SEMICONDUCTOR **DEVICE**
INVENTOR: HARA KOJI; TAKAHARA YOICHI; SAEKI TOMONORI; TOMIOKA HIDEKI; ITO MASAKI; TSUGANE MASARU; ITO HARUO; FUNAHASHI TOMOMASA
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002025964	A	20020125	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 2000-206828 20000704
ORIGINAL: JP2000206828 Heisei
PRIORITY APPLN. INFO.: JP 2000-206828 20000704

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002

AN 2002-025964 JAPIO
AB PROBLEM TO BE SOLVED: To protect electrodes or wirings formed of high-melting metal nitride against etching at **cleaning** after the electrodes or wirings are formed in the manufacture of a semiconductor **device** provided with the electrodes or wirings formed of high-melting metal nitride.
SOLUTION: A semiconductor **device** manufacturing method comprises a first process of forming conductor films that contain high-melting point nitride films on a semiconductor **substrate**, a second process of patterning the conductor films into required forms, and a third process of **cleaning** the patterned conductor films. A **cleaning solution** used in the third process of **cleaning** the patterned conductor films is a mixed **solution** of quaternary **ammonium hydroxide** represented by general formula, [(R1)nN(R)4-n]+OH- (R1 is a 1-2C alkyl group, R is a 1-2C alkyl group or a 1-2C hydroxy-substituted alkyl group, and R1 and R may be identical to each other or different from each other. n is an integer of 1 to 3), a **hydrogen peroxide solution**, and

pure **water**.
COPYRIGHT: (C)2002,JPO
IC ICM H01L021-304
ICS H01L021-28; H01L021-3213; H01L021-3205; H01L029-43; H01L029-78

L87 ANSWER 2 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-326209 JAPIO
TITLE: METHOD FOR TREATING SURFACE OF SILICON **SUBSTRATE**
INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001326209	A	20011122	Heisei	H01L021-306

APPLICATION INFORMATION
STN FORMAT: JP 2000-142764 20000516
ORIGINAL: JP2000142764 Heisei
PRIORITY APPLN. INFO.: JP 2000-142764 20000516
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001
AN 2001-326209 JAPIO
AB PROBLEM TO BE SOLVED: To provide a method for treating surface of silicon **substrate** by which a **clean** silicon **substrate** can be obtained by well removing fine damages caused by working and organic matters, metallic impurities, and fine particles adhering to the surface of the **substrate** through a small number of steps and, in addition, the fraction non-defective after film formation can be improved. **SOLUTION**: This method includes a step 11 of dipping the silicon **substrate** in a mixed **solution** of **hydrogen peroxide** and **ammonium hydroxide**, etc., a step 12 of dipping the silicon **substrate** dipped in the mixed **solution** in at least one oxidizing liquid selected from among a dissolved ozone aqueous **solution**, nitric acid, and **hydrogen peroxide**, and a step 13 of dipping the silicon **substrate** dipped in the oxidizing liquid in a mixed **solution** of an organic acid or its salt and hydrofluoric acid. The method also includes a step 14 of dipping the silicon **substrate** dipped in the mixed **solution** in the step 13 in a liquid containing the organic acid or its salt and rinsing steps using extremely pure **water** among the steps 11, 12, 13 and 14.
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IC ICM H01L021-306
ICS H01L021-304

L87 ANSWER 3 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-284450 JAPIO
TITLE: MANUFACTURING METHOD FOR SEMICONDUCTOR **DEVICE** AND SEMICONDUCTOR **DEVICE**
INVENTOR: MORIMOTO NOBORU; MATSUURA MASAZUMI; GOTO KINYA
PATENT ASSIGNEE(S): MITSUBISHI ELECTRIC CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001284450	A	20011012	Heisei	H01L021-768

APPLICATION INFORMATION

STN FORMAT: JP 2000-100483 20000403
ORIGINAL: JP2000100483 Heisei
PRIORITY APPLN. INFO.: JP 2000-100483 20000403
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-284450 JAPIO
AB PROBLEM TO BE SOLVED: To provide a method for manufacturing a semiconductor **device** which can avoid a short circuit between each electric wiring in an upper layer electric wiring, even when a part of top of a FSG film is exposed by dispersion of a manufacturing process.
SOLUTION: A method includes grinding to remove a USG film 4 by 900 nm thick from the top with a CMP method, after depositing the USG film 4 with 1 ×m of film thickness all over a FSG film 3. At this time, a part of the top of the FSG film is exposed by dispersion of the manufacturing process. And next, the surface of an interlayer insulation film 50 is washed with a **cleaning solution** which has an etching rate for the FSG film 5 almost equal to an etching rate for the USG film 3. Such a **cleaning solution** includes, for example, ammonia hyperhydration of **NH4OH:H2O2**: **H2O**=1:1:20. The surface of the interlayer isolation film 50 is washed by means of immersing a structure shown in Figure 5 in the ammonia hyperhydration for 60 seconds.

IC ICM H01L021-768
ICS H01L021-306; H01L021-316

L87 ANSWER 4 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-212968 JAPIO
TITLE: METHOD FOR **CLEANING** CRYSTAL **SUBSTRATE** USING CONDUCTIVE **SOLUTION**
INVENTOR: RAGHAVAN NADIPURAM V VIJAYA; LEUNG ELAINE LAI-YEE
PATENT ASSIGNEE(S): AGILENT TECHNOL INC
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001212968	A	20010807	Heisei	B41J002-16

APPLICATION INFORMATION
STN FORMAT: JP 2000-348463 20001115
ORIGINAL: JP2000348463 Heisei
PRIORITY APPLN. INFO.: US 1999-441716 19991116
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-212968 JAPIO
AB PROBLEM TO BE SOLVED: To provide a method for efficiently **cleaning** crystal **substrates** which require a low defect density.
SOLUTION: This processing method for **cleaning** the crystal **substrate** (74) comprises a step (34) of applying a **solution** containing **water** and **ammonium hydroxide** to the crystal **substrate**, a step (36) of treating the crystal **substrate** with a **solution** containing **hydrogen peroxide** and a predetermined acid, a process (38) of rinsing the crystal **substrate** with **water** saturated with carbonate, a process (40) of applying a **solution** including **water** and **ammonium hydroxide** to the rinsed crystal **substrate**, and a process of rinsing the crystal **substrate** again with **water** saturated with carbonate.

IC ICM B41J002-16
ICS B08B003-08; G03F001-08

L87 ANSWER 5 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-189297 JAPIO
TITLE: METHOD AND **DEVICE** FOR **CLEANING** **WAFER**
INVENTOR: SUZUKI TATSUYA
PATENT ASSIGNEE(S): NEC CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001189297	A	20010710	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1999-372658 19991228
ORIGINAL: JP11372658 Heisei
PRIORITY APPLN. INFO.: JP 1999-372658 19991228
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-189297 JAPIO
AB PROBLEM TO BE SOLVED: To provide a method for **cleaning** a **wafer** suited to pre-processing or post-processing for micro machining semiconductor **device**, using a single-tank **wafer cleaning device**.
SOLUTION: This **cleaning** method is used to **clean** a **wafer** arranged vertically in a tank, by jetting a chemical **solution** and a **cleaning water** oblequely upward or obliquely downward. This method includes a step for dipping the **wafer** in the tank where the **cleaning** **water** is filled and streamed, a step for **cleaning** the **wafer** by supplying a first chemical **solution** that an ammonium, **hydrogen peroxide** and **water** are mixed at a volume ratio of **NH4OH:H2O2: water** = 1:1:X1 (where X1: >20 and <70) and using an upward stream, a step for applying a dip **cleaning**, a step to for supplying a second chemical **solution** that an ammonium, **hydrogen** **peroxide** and **water** are mixed at a volume ratio of 1:1:X2 (X2>X1) and has a **cleaning** performance and to substitute the first chemical **solution** with the second chemical **solution**, a step for applying QDR **cleaning**, and a step to supply a rinsing **water** and rinse the **water** by using the upward stream rinsing **water**.
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IC ICM H01L021-304

L87 ANSWER 6 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2001-044155 JAPIO
TITLE: BRUSHLESS MULTIPLE PATH **CLEANING** METHOD FOR SILICON **WAFER** AFTER CHEMICAL-MECHANICAL POLISHING USING IMMERSION
INVENTOR: HACKENBERG DIANA
PATENT ASSIGNEE(S): INTERSIL CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001044155	A	20010216	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 2000-173059 20000609
ORIGINAL: JP2000173059 Heisei
PRIORITY APPLN. INFO.: US 1999-342948 19990629
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-044155 JAPIO
AB PROBLEM TO BE SOLVED: To reduce extra manufacturing cost and manufacturing time by immersing a **wafer** into a first megasonic chemical bath having a pH value equal to that of a substance to be removed and then **cleaning** the **wafer** with this megasonic bath.
SOLUTION: A silicon **wafer** is dipped into an interfacial active agent and thereafter it is then immersed into a megasonic bath including the **solution** consisting of ultra-pure **water, ammonium hydroxide** and **hydrogen peroxide** having the pH value equal to that of the substance to be removed for the first chemical megasonic sub-cycle. Immediately after the first chemical megasonic sub-cycle, the **wafer** is washed with the **cleaning water** using a megasonic unit for the first **water-cleaning** cycle. Moreover, with the same method, the stages of the second to fourth chemical megasonic cycles and second to sixth megasonic cycles are executed. Thereby, extra manufacturing cost and production time can be reduced.
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IC ICM H01L021-304
ICS B08B003-08; B08B003-12

L87 ANSWER 7 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-208469 JAPIO
TITLE: METHOD OF EVALUATING QUALITY OF SEMICONDUCTOR **WAFER**
INVENTOR: MIYAZAKI SUMIO; MIYAZAKI MORIMASA
PATENT ASSIGNEE(S): SUMITOMO METAL IND LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000208469	A	20000728	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1999-9404 19990118
ORIGINAL: JP11009404 Heisei
PRIORITY APPLN. INFO.: JP 1999-9404 19990118
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-208469 JAPIO
AB PROBLEM TO BE SOLVED: To provide a method for evaluating the quality of a semiconductor **wafer** that can conveniently evaluate characteristics of a semiconductor **wafer** such as a breakdown voltage characteristic of an oxide film, etc.
SOLUTION: This method of evaluating the quality of a semiconductor **wafer** includes the steps of **cleaning** a semiconductor **wafer** surface a plurality of times by using a mixture **solution** of **NH4OH, H2O2** and **H2O** at a compounding ratio with a high etch selectivity against defects and surface roughness present near the semiconductor **wafer** surface, and evaluating the quality of the semiconductor **wafer** surface by measuring the distribution of light point defects(LPD) in the **wafer** surface by using a surface inspecting **device** using a high-intensity light source such as a laser, etc.

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IC ICM H01L021-304
ICS G01N021-88

L87 ANSWER 8 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-091291 JAPIO
TITLE: WASHING METHOD OF SILICON **WAFER**
INVENTOR: SATO MASANORI; SUZUKI YASUHIRO
PATENT ASSIGNEE(S): MEMC KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000091291	A	20000331	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1998-258548 19980911
ORIGINAL: JP10258548 Heisei
PRIORITY APPLN. INFO.: JP 1998-258548 19980911
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
AN 2000-091291 JAPIO
AB PROBLEM TO BE SOLVED: To provide a washing method of a silicon **wafer** which can improve both oxide film breakdown strength characteristic and **cleanliness** of a silicon **wafer** surface at once.
SOLUTION: After a silicon **wafer** is washed by ozone-added ultra-pure **water** and a silicon **wafer** is washed by **NH4OH-H2O2** mixed **solution** of 30 to 70°C, a silicon **wafer** is further washed by ozone-added ultra-pure **water** and a silicon **wafer** is washed by **NH4OH-H2O2-H2O** mixed **solution** of 40 to 80°C. Both oxide film breakdown strength characteristic and **cleanliness** of a silicon **wafer** surface can be improved at once by combining ozone-added ultra-pure **water** washing which is excellent in decomposition/removal of organic compound and removal of transition metal impurities (especially, Cu) and washing by **NH4OH -H2O2-H2O** mixed **solution** which is excellent in washing effect.
COPYRIGHT: (C)2000,JPO
IC ICM H01L021-304
ICS B08B003-08

L87 ANSWER 9 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-049133 JAPIO
TITLE: METHOD OF **CLEANING** SEMICONDUCTOR **SUBSTRATE**
INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI; YANAGI SHIGENARI
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000049133	A	20000218	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1998-217148 19980731
ORIGINAL: JP10217148 Heisei
PRIORITY APPLN. INFO.: JP 1998-217148 19980731
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined

Applications, Vol. 2000
AN 2000-049133 JAPIO
AB PROBLEM TO BE SOLVED: To remove microscopic damages caused by processing a semiconductor **substrate**, satisfactorily removing fine particles adhered to the surface of the semiconductor **substrate**, using the reduced number of processes and remove metallic impurity adhered to the surface of the semiconductor **substrate**.
SOLUTION: After impregnating a semiconductor **substrate** in a mixture of **hydrogen peroxide** and **ammonium hydroxide** and then in dissolved ozone **water**, the semiconductor **substrate** is impregnated in a liquid containing hydrofluoric acid at 0.005-0.25 weight%. After this, it is preferably soaked in oxidizing liquid. Organic acid or organic salt at 0.0001 weight% or more is further preferably added to hydrofluoric acid.
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IC ICM H01L021-304
ICS B08B003-08; C11D007-08; C11D007-18; C11D007-60

L87 ANSWER 10 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 2000-049132 JAPIO
TITLE: METHOD OF **CLEANING** SEMICONDUCTOR **SUBSTRATE**
INVENTOR: TAKADA RYOKO; TAKAISHI KAZUNARI
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000049132	A	20000218	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1998-217147 19980731
ORIGINAL: JP10217147 Heisei
PRIORITY APPLN. INFO.: JP 1998-217147 19980731
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
AN 2000-049132 JAPIO
AB PROBLEM TO BE SOLVED: To satisfactorily remove organic substances, metallic impurities and fine particles adhered to the surface of a semiconductor **substrate**, using the reduced number of processes and remove microscopic damages occurring due to processing the semiconductor **substrate**.
SOLUTION: After impregnating a semiconductor **substrate** in a mixture of hydrofluoric acid at 0.005-0.25 weight % and organic acid or organic salt at 0.0001 weight % or more, the semiconductor **substrate** is impregnated in rinsing **solution** containing organic acid or organic salt. Before impregnating it in the mixture, the semiconductor **substrate** is soaked in a mixture of **hydrogen peroxide** and **ammonium hydroxide** and is them preferably rinsed with ultrapure **water**. After impregnating it in the rinsing **water** containing organic acid or organic salt, it is preferably soaked in oxidizing liquid. In addition, hydrofluoric acid at 0.1 weight % or less may be added to the rinsing **water** containing organic acid or organic salt.
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IC ICM H01L021-304
ICS B08B003-08; C11D007-08; C11D007-26; C11D007-60

L87 ANSWER 11 OF 15 JAPIO (C) 2003 JPO on STN

ACCESSION NUMBER: 2000-036479 JAPIO
TITLE: PRODUCTION OF SEMICONDUCTOR **DEVICE**
INVENTOR: HARA KOJI; TAKAHARA YOICHI; SAEKI TOMONORI; TOMIOKA HIDEKI; ITO MASAKI; TSUGANE MASARU; ITO HARUO; FUNAHASHI TOMOMASA
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000036479	A	20000202	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1998-202930 19980717
ORIGINAL: JP10202930 Heisei
PRIORITY APPLN. INFO.: JP 1998-202930 19980717
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-036479 JAPIO
AB PROBLEM TO BE SOLVED: To enhance reliability by employing a mixed liquid of a specified tertiary **ammonium hydroxide**, **hydrogen peroxide water** and ultrapure **water** in the **cleaning** after formation of a gate electrode using a high melting point metal nitride, i.e., tungsten nitride.

SOLUTION: A multiplayer conductor film including a high melting point metal nitride, i.e., tungsten nitride film, is formed on a semiconductor **substrate** and patterned into a desired shape before being **cleaned**. A mixed liquid of a tertiary **ammonium hydroxide**, **hydrogen peroxide water** and ultrapure **water** represented by a formula [I(R1)nN(R)4-n+OH- (R1 is alkyl group of 1-4C, R is alkyl group of 1-4C or hydroxy substituted alkyl group of 1-4C, R1 and R may be identical or not, and n is an integer of 1-3)]. According to the method, the tungsten nitride film can be protected against being etched at the time of **cleaning**.

IC ICM H01L021-304
ICS H01L021-28; H01L029-78

L87 ANSWER 12 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1999-274129 JAPIO
TITLE: **CLEANING** OF SEMICONDUCTOR **SUBSTRATE**
INVENTOR: TAKADA RYOKO; FUJIMOTO MARUHISA; TAKAISHI KAZUNARI
PATENT ASSIGNEE(S): MITSUBISHI MATERIALS SILICON CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 11274129	A	19991008	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1998-77257 19980325
ORIGINAL: JP10077257 Heisei
PRIORITY APPLN. INFO.: JP 1998-77257 19980325
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999

AN 1999-274129 JAPIO
AB PROBLEM TO BE SOLVED: To remove fine damages caused by the processing of a semiconductor **substrate** and to properly remove organic matter,

metallic impurities and fine particles deposited on the semiconductor **substrate** in few number of steps.
SOLUTION: A semiconductor **substrate** is **cleaned** with use of a mixture **solution** of **hydrogen peroxide** and **ammonium hydroxide** and then rinsed with ultra-pure **water**. The rinsed **substrate** is **cleaned** with the use of a **cleaning solution** containing 0.0001 weight % or more of organic acid or organic acid chloride. The **substrate** is further **cleaned** with an oxidizing **solution**. Preferably, the **cleaning solution** is added in the organic acid or organic acid chloride and 0.005-0.25 weight % of hydrofluoric acid is further included.
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IC ICM H01L021-304

L87 ANSWER 13 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1997-270412 JAPIO
TITLE: **CLEANING DEVICE** AND METHOD
INVENTOR: MIYAWAKI MAMORU
PATENT ASSIGNEE(S): CANON INC
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 09270412	A	19971014	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1996-79041 19960401
ORIGINAL: JP08079041 Heisei
PRIORITY APPLN. INFO.: JP 1996-79041 19960401
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997
AN 1997-270412 JAPIO
AB PROBLEM TO BE SOLVED: To remove flowing materials by suction so as to prevent foreign objects from adhering around the edge of a **substrate** and being left even after **cleaning** by a method wherein a suction opening is provided around the contacting part of a **substrate** holding member with the side of the **substrate**.
SOLUTION: A vacuum pump connected to an exhaust vent and a drainage opening is actuated to reduce a **cleaning** tank in pressure, and then nitrogen gas is introduced into the **cleaning** tank through a nozzle 6. Ultra-pure **water** loaded with 2 to 10ppm of ozone is made to drop down on the surface of a **wafer** 3 through a chemical nozzle 2 keeping the **wafer** 3 rotating at a speed of 1500 to 3000rpm. In succession, mixed liquid composed of **ammonium hydroxide, hydrogen peroxide** aqueous **solution**, and ultra-pure **water** mixed at the ratio 2:1:5 and another mixed liquid composed of hydrofluoric acid and ultra- pure **water** mixed at the ratio 0.01:1 are successively made to drop down on the surface of the **wafer** 3, and lastly mixed liquid composed of isopropyl alcohol and ultra-pure **water** mixed at the ratio 1:5 is made to drop down. Then, the mixed liquid is stopped, and nitrogen gas is blown against the surface of the **wafer** 3 to dry it out.
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IC ICM H01L021-304
ICS H01L021-304; H01L021-68

L87 ANSWER 14 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1992-107923 JAPIO

TITLE: **CLEANING** METHOD FOR SEMICONDUCTOR **SUBSTRATE**
INVENTOR: SHIROMIZU YOSHIMI
PATENT ASSIGNEE(S): FUJITSU LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 04107923	A	19920409	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1990-227126 19900829
ORIGINAL: JP02227126 Heisei
PRIORITY APPLN. INFO.: JP 1990-227126 19900829
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1992

AN 1992-107923 JAPIO
AB PURPOSE: To keep **cleaning** condition constant and reduce the metallic impurity pollution at the semiconductor **substrate** face by soaking a semiconductor **substrate** in the **cleaning** liquid, which is diluted with **water** within the range of not losing the **cleaning** effect and consists of the mixed liquid of **ammonium hydroxides, hydrogen peroxides,** and **water** and is heated in the condition that it is shut off by inert gas, and then applying ultrasonics to it so as to produce new **hydrogen peroxides** in the **cleaning** liquid, and then stopping only the ultrasonics, and **cleaning** it in this **cleaning** liquid.
CONSTITUTION: The **cleaning** liquid, which is diluted in, for example, [30%nH<SB>4</SB>OH **solution**: 30%H<SB>2</SB>O<SB>2</SB>: H<SB>2</SB>O:1:1:1000] by wt. ratio, is used and it is heated at a constant temperature of about 60-80°C in the condition that the surface is shut off from the air, and in this **cleaning** liquid, a semiconductor **substrate** is soaked, and then as in the condition that the semiconductor **substrate** is soaked, ultrasonics are applied to produce H<SB>2</SB>O<SB>2</SB>, and the concentration of H<SB>2</SB>O<SB>2</SB> is restored to the concentration approximately equal to the initial concentration. Next, only the ultrasonics are stopped, and the semiconductor **substrate** is kept in the regenerated **cleaning** liquid successively.

IC ICM H01L021-304

L87 ANSWER 15 OF 15 JAPIO (C) 2003 JPO on STN
ACCESSION NUMBER: 1992-000719 JAPIO
TITLE: METHOD AND APPARATUS FOR **CLEANING** TREATMENT
INVENTOR: SAKURAI TOSHIHIKO; HARAZONO MASAAKI
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 04000719	A	19920106	Heisei	H01L021-304

APPLICATION INFORMATION
STN FORMAT: JP 1990-102157 19900418
ORIGINAL: JP02102157 Heisei
PRIORITY APPLN. INFO.: JP 1990-102157 19900418
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1992

AN 1992-000719 JAPIO
AB PURPOSE: To increase the **cleaning**-treatment number of objects to be treated by executing the following: a first **cleaning** treatment by which the objects to be treated are immersed in a mixed **solution** of **hydrogen peroxide** and pure **water**; and a second **cleaning** treatment by which the objects to be treated are immersed in a mixed **solution** of **hydrogen peroxide** and **ammonium hydroxide**.
CONSTITUTION: A **wafer** 2 is conveyed to a **cleaning** tank 4b by using a conveyance arm 6; it is immersed in a mixed **solution** of H<SB>2</SB>O<SB>2</SB> and pure **water** which has been introduced into the **cleaning** tank 4b as a chemical liquid. In the **cleaning** tank 4b, organic substances 13 which have adhered to the **wafer** 2 are oxidized by H<SB>2</SB>O<SB>2</SB> in the chemical liquid. Then, the **wafer** 2 is conveyed to a **cleaning** tank 4c by using the conveyance arm 6; it is immersed in a mixed **solution** of H<SB>2</SB>O<SB>2</SB>, NH<SB>4</SB>OH and pure **water** which has been introduced into the **cleaning** tank 4c as a chemical liquid. In the **cleaning** tank 4c, the organic substances 13 which have been oxidized at the first **cleaning** treatment are removed by H<SB>2</SB>O<SB>2</SB> and NH<SB>4</SB>OH inside the **cleaning** tank 4c. Consequently, when the treatment temperature inside the **cleaning** tank 4c is set to be high, the removal speed of the organic substances 13 is increased and the removal treatment time of the organic substances 13 inside the **cleaning** tank 4c can be shortened.

IC ICM H01L021-304

=> file wpix
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=> d L89 1-8 all

L89 ANSWER 1 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2003-079189 [08] WPIX
DNN N2003-061630 DNC C2003-020989
TI **Cleaning** liquid for electronic component, contains hydrogen fluoride and **surfactant**.
DC L03 U11
PA (OMIT-I) OMI T; (ULTR-N) ULTRACLEAN TECHNOLOGY KAIHATSU KENKYUSHO
CYC 1
PI JP 2002261069 A 20020913 (200308)* 9p H01L021-304
ADT JP 2002261069 A JP 2001-55364 20010228
PRAI JP 2001-55364 20010228
IC ICM H01L021-304
ICS C11D003-04; C11D003-395; C11D007-04; C11D010-02; C11D017-08
AB JP2002261069 A UPAB: 20030204
NOVELTY - A **cleaning** liquid contains 0.05-0.5 weight% of hydrogen fluoride and a **surfactant**.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for **cleaning** of electronic component. The concentration of ozone in the electronic component after washing with ozone **water** is 1 mg/l or more. The electronic component is then **cleaned** using **cleaning** liquid containing hydrogen fluoride and **surfactant**.
USE - For removing contaminants such as metal, organic substance and microparticle, on semiconductor **substrate** of electronic component.
ADVANTAGE - The contaminants on semiconductor **substrate** surface are removed effectively without damaging the fine structures on the **substrate**. The process is performed stably in a short time at room temperature. Curtailment and miniaturization of washing apparatus are attained. The cost of electronic component is lowered.
DESCRIPTION OF DRAWING(S) - The graph shows characteristic view of temperature dependency of particulate-removal effect of **cleaning** liquid containing **ammonium hydroxide**, **hydrogen peroxide** and **water**. (Drawing includes non-English language text).
Dwg.1/10
FS CPI EPI
FA AB; GI
MC CPI: L04-C09
EPI: U11-A10; U11-C06A1B

L89 ANSWER 2 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-740773 [80] WPIX
DNN N2002-583640 DNC C2002-209749
TI Method of permanently waving hair involves wrapping dry hair onto several wrapping **devices**, applying waving lotion to dry hair and processing treated hair to obtain permanently waved hair.
DC A96 A97 D21 E19 P24
IN RATHNAM, J
PA (RATH-I) RATHNAM J
CYC 100
PI WO 2002071890 A1 20020919 (200280)* EN 52p A45D007-06
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW

US 2003024542 A1 20030206 (200313) A45D007-04
US 6557562 B2 20030506 (200338) A45D024-00
ADT WO 2002071890 A1 WO 2002-US6630 20020305; US 2003024542 A1 US 2001-802339 20010309; US 6557562 B2 US 2001-802339 20010309
PRAI US 2001-802339 20010309
IC ICM A45D007-04; A45D007-06; A45D024-00
ICS A61K007-06; A61K007-13
AB WO 200271890 A UPAB: 20021212
NOVELTY - A method of permanently waving hair, involves wrapping dry hair onto several wrapping **devices**, applying a waving lotion to the dry hair and processing the treated hair to obtain permanently waved hair.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for straightening hair which involves applying a waving lotion to dry hair and applying tension to the hair having the applied waving lotion to obtain straightened hair.
USE - For permanently perming or straightening hair.
ADVANTAGE - The method enables permanent waving of hair in a short processing time using very low concentrations of treatment chemicals. Desired perms are achieved in a safe way for environment, perm clients, hair dressers and manufacturers. The method maximizes the benefits by virtually removing or minimizing problems of perming such as delayed penetrations, dilution and spilling of waving lotion. The lotion used is ultra mild, least spilling, processed at room temperature for very short period, contact time with the scalp is short and is safe. The cost of active raw materials used in the ultra mild perm formulations is reduced about 50-75% compared to high strength perm formulation.
Dwg.0/0
FS CPI GMPI
FA AB; DCN
MC CPI: A12-V04A; D08-A; D08-B05; E10-B02D1; E10-B04E; E10-B04E1; E10-C04D2; E10-E03K; E32-A02; E32-A04; E33-A03; E33-C

L89 ANSWER 3 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2002-426448 [45] WPIX
CR 2000-062516 [05]
DNN N2002-335323 DNC C2002-120920
TI Stabilized alkaline composition for stripping or **cleaning** **integrated circuit substrates** includes metal ion-free base and bath stabilizing agent.
DC D25 E19 L03 P43 P84 Q73 U11
IN SKEE, D C
PA (MLCW) MALLINCKRODT BAKER INC; (SKEE-I) SKEE D C; (MLCW) MALLINCKRODT INC
CYC 95
PI WO 2002033033 A1 20020425 (200245)* EN 68p C11D003-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
US 2002077259 A1 20020620 (200247) B08B007-00
AU 2001096947 A 20020429 (200255) C11D003-00
EP 1326951 A1 20030716 (200347) EN C11D003-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
US 6599370 B2 20030729 (200354) C23G001-02
ADT WO 2002033033 A1 WO 2001-US42406 20010928; US 2002077259 A1 CIP of US 2000-688559 20001016, US 2001-859142 20010516; AU 2001096947 A AU 2001-96947 20010928; EP 1326951 A1 EP 2001-977863 20010928, WO 2001-US42406 20010928; US 6599370 B2 CIP of US 2000-688559 20001016, US

2001-859142 20010516
FDT AU 2001096947 A Based on WO 2002033033; EP 1326951 A1 Based on WO 2002033033
PRAI US 2001-859142 20010516; US 2000-688559 20001016
IC ICM B08B007-00; C11D003-00; C23G001-02
ICS B08B003-00; B08B003-10; B08B003-14; C03C023-00; C11D007-26; C11D007-32; C23G001-00; F23J001-00; G03F007-42
AB WO 200233033 A UPAB: 20030821
NOVELTY - A stabilized alkaline composition comprises:
(a) metal ion-free base(s);
(b) bath stabilizing agent(s) of pKa 10-13; and
(c) **water**.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of **cleaning** semiconductor **wafer substrates** by contacting the **substrate** surface with the composition for a time and at a temperature to **clean** unwanted contaminants and residues from the surface.
USE - For stripping or **cleaning integrated circuit substrates** in the microelectronics industry.
ADVANTAGE - The composition removes metallic and organic contaminants from the semiconductor **wafer substrates** without damaging the **integrated circuits**, and avoids the expense and adverse consequences caused by intermediate rinses. It has a very long effective bath life.
Dwg.0/0
FS CPI EPI GMPI
FA AB; DCN
MC CPI: **D11-A01B1**; **D11-A02B**; **D11-A02B2**; **D11-B01B**; E07-D04C; E07-D04D; E10-A18B; E10-A22E; E10-A22G; E10-B01E; L04-C09
EPI: U11-C04A1

L89 ANSWER 4 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2001-610387 [70] WPIX
DNN N2001-455588 DNC C2001-182224
TI Semiconductor **wafer cleaning** involves applying aqueous solution containing **ammonium hydroxide** on **wafer** having exposed metal region and simultaneously applying ultrasonic energy to solution.
DC L03 P43 U11
IN GULDI, R L; RITCHISON, J W
PA (TEXI) TEXAS INSTR INC
CYC 1
PI US 6267122 B1 20010731 (200170)* 8p B08B003-12
ADT US 6267122 B1, US 1993-119785 19930910
PRAI US 1993-119785 19930910
IC ICM B08B003-12
AB US 6267122 B UPAB: 20011129
NOVELTY - A solution containing **water** and **ammonium hydroxide** is applied to a **wafer** having exposed metal regions. Simultaneously, ultrasonic energy is applied to the solution and the **wafer** is **cleaned**.
DETAILED DESCRIPTION - A **surfactant** is added to the solution containing **ammonium hydroxide** and **water** in a ratio of 0.001-0.2. The solution is maintained at a temperature of 25-90 deg. C. After applying the solution, the **wafer** is rinsed with **water**.
USE - For **cleaning** silicon semiconductor **wafers** during electronic **device** fabrication.
ADVANTAGE - The application of ultrasonic energy to the solution

enhances the **wafer cleaning** efficiency. The particulate is efficiently removed from the **wafer** without using **hydrogen peroxide** that damages titanium nitride layer. The method utilizes wide range of concentrations, treatment times and bath temperatures based on particular demands including solution lifetime and cost.
Dwg.0/9

FS CPI EPI GMPI
FA AB
MC CPI: L04-C09
EPI: U11-A10; U11-C06A1B

L89 ANSWER 5 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1999-256612 [22] WPIX
DNN N1999-191203 DNC C1999-075277
TI Polishing method for metal film, especially in semiconductor interconnection process.
DC A14 A32 A35 A85 G02 L03 P61 U11
IN HINODE, K; HOMMA, Y; KONDO, S; SAKUMA, N; TAKEDA, K
PA (HITA) HITACHI LTD
CYC 31
PI EP 913442 A2 19990506 (199922)* EN 42p C09G001-02
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 11135466 A 19990521 (199931) 19p H01L021-304
CN 1216727 A 19990519 (199938) B24B037-00
KR 99037374 A 19990525 (200032) H01L021-302
US 6117775 A 20000912 (200046) H01L021-302
TW 380083 A 20000121 (200047) B24B007-20
JP 2001298009 A 20011026 (200203) 19p H01L021-304
JP 3371775 B2 20030127 (200315) 19p H01L021-304
SG 95588 A1 20030423 (200337) H01L021-306
US 6117775 C1 20030715 (200354) H01L021-302
US 6596638 B1 20030722 (200354) H01L021-302
ADT EP 913442 A2 EP 1998-308923 19981030; JP 11135466 A JP 1997-299937 19971031; CN 1216727 A CN 1998-123672 19981030; KR 99037374 A KR 1998-44809 19981026; US 6117775 A US 1998-182438 19981030; TW 380083 A TW 1998-116346 19981001; JP 2001298009 A Div ex JP 1997-299937 19971031, JP 2001-77422 19971031; JP 3371775 B2 JP 1997-299937 19971031; SG 95588 A1 SG 1998-4195 19981013; US 6117775 C1 US 1998-182438 19981030; US 6596638 B1 Cont of US 1998-182438 19981030, US 2000-618999 20000718
FDT JP 3371775 B2 Previous Publ. JP 11135466; US 6596638 B1 Cont of US 6117775
PRAI JP 1997-299937 19971031; JP 2001-77422 19971031
IC ICM B24B007-20; B24B037-00; C09G001-02; H01L021-302; H01L021-304; H01L021-306
ICS C09K003-14
ICA B24B037-04
AB EP 913442 A UPAB: 19990609
NOVELTY - The polishing method for removing at least part of a metal film, involves mechanically rubbing a metal film surface using a polishing solution comprising less than 1 wt % of a polishing abrasive. The solution has a pH and oxidation-reduction potential in the domain of corrosion of the metal film. The polishing abrasive may also have an oxidizer and a substance which renders an oxide **water**-soluble.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for a method of manufacturing a semiconductor **device** by forming an insulating film, having an opening exposing an impurity-doped layer, interconnection layer or conducting layer on a **substrate**, forming a metal film, removing the metal film by the above method, **cleaning** and drying

USE - Polishing a metal film in a semiconductor **device** interconnection process.

ADVANTAGE - Reduced scratches on the metal film surface, dishing and erosion are suppressed, peeling is reduced, the cost of the polishing solution and polishing pad are reduced, throughput is increased, and dust production is suppressed.

DESCRIPTION OF DRAWING(S) - The figure shows the chemical mechanical polishing machine used to implement the method.

Dwg.1/26

FS CPI EPI GMPI
FA AB; GI
MC CPI: A11-B05; A11-C; A12-E04; A12-E07C; G02-C; L04-B04
EPI: U11-A10; U11-C06A1A; U11-C07C2

L89 ANSWER 6 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1997-289504 [26] WPIX
DNN N1997-239721 DNC C1997-093195
TI Production of **wafer-cleaning** solutions used for washing semiconductors - by mixing hydro fluoric acid, hydrogen per oxide, nitric acid, alkyl **ammonium hydroxide**, **surfactants** and **water**.
DC A97 D25 E19 L03 U11
IN ITANO, M; KAMIYA, F; KEZUKA, T; SUYAMA, M
PA (DAIK) DAIKIN IND LTD; (DAIK) DAIKIN KOGYO KK
CYC 22
PI WO 9718582 A1 19970522 (199726)* JA 21p H01L021-304
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: CN JP KR US
EP 871209 A1 19981014 (199845) EN H01L021-304
R: DE FR GB IT
JP 09518733 X 19990126 (199914) H01L021-304
CN 1202274 A 19981216 (199918) H01L021-304
US 6068788 A 20000530 (200033) C09K013-04
KR 99063592 A 19990726 (200043) H01L021-304
TW 387944 A 20000421 (200061) C23F001-16
US 6159865 A 20001212 (200067)# H01L021-302
KR 269013 B1 20001101 (200139) H01L000-00
ADT WO 9718582 A1 WO 1996-JP3313 19961111; EP 871209 A1 EP 1996-937559 19961111, WO 1996-JP3313 19961111; JP 09518733 X WO 1996-JP3313 19961111, JP 1997-518733 19961111; CN 1202274 A CN 1996-198370 19961111; US 6068788 A WO 1996-JP3313 19961111, US 1998-51492 19980422; KR 99063592 A WO 1996-JP3313 19961111, KR 1998-702035 19980319; TW 387944 A TW 1996-115661 19961219; US 6159865 A Div ex US 1998-51492 19980422, US 2000-523216 20000310; KR 269013 B1 WO 1996-JP3313 19961111, KR 1998-702035 19980319
FDT EP 871209 A1 Based on WO 9718582; JP 09518733 X Based on WO 9718582; US 6068788 A Based on WO 9718582; KR 99063592 A Based on WO 9718582; US 6159865 A Div ex US 6068788
PRAI JP 1995-322292 19951115; JP 1995-322291 19951115; US 2000-523216 20000310
REP JP 641770; JP 684866; JP 745600
IC ICM C09K013-04; C23F001-16; H01L000-00; H01L021-302; H01L021-304
ICS C09K013-00; C09K013-06; C09K013-08; C11D001-12; C11D003-04; C11D017-08; H01L021-308
AB WO 9718582 A UPAB: 19970626
A **wafer-cleaning** solution comprises 20-60 wt.% hydrofluoric acid (HF) with 0.1-1000 ppm CnH2n+1ph(SO3M)Oph(SO3M) (where, ph = phenylene, n = 5-20, M = H or salt), CnH2n+1phO(CH2CH2O)mSO3M (where, m = 0-20) and CnH2n+1O(CH2CH2O)mSO3M, and the balance of **water**.
Also claimed is a processes for producing the **wafer-cleaning** solution by diluting the above **cleaning**

solution with **water** to contain 0.1-5 wt.% HF and 0.01-100 ppm of the above **surfactant**(s). This is carried by adding **water** and **hydrogen peroxide** (**H2O2**) to the **cleaning** solution to contain 0.1-10 wt.% HF, 0.01-30 wt.% **H2O2** and 0.01-100 ppm of the above **surfactant**(s). Next, **water** and nitric acid (HNO3) are added to the above **cleaning** solution so it contains 0.1-50 wt.% HF, 0.1-70 wt.% HNO3 and 0.01-100 ppm of the **surfactant**(s). **Water** and ammonium fluoride (NH4F) are then added to the **cleaning** solution so it contains 0.1-10 wt.% HF, 1-40 wt.% NH4F and 0.01-100 ppm of the **surfactant**(s). Further claimed are several other solutions.

USE - The **wafer-cleaning** solutions are used prevent contamination due to adhered microparticles and other foreign bodies on silicon or thermal-acidified membrane **wafer**, semiconductor elements and the like.

ADVANTAGE - The **wafer-cleaning** solutions have excellent solubility, storability and transportability, without foaming.

Dwg.0/0

FS CPI EPI
FA AB; DCN
MC CPI: A12-E07A; A12-W12B; **D11-A01A**; **D11-A01B1**; **D11-A01B2**; **D11-A03A**; E10-A09A; E10-A09B4; E10-A22E; E10-A22G; E31-B03C; E31-E; E31-H05; E32-A04; L04-C09
EPI: U11-C06A1B

L89 ANSWER 7 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1990-380242 [51] WPIX
DNN N1990-289717 DNC C1990-165687
TI Wet **cleaning** process for semiconductor **substrate** - comprises treatment with hydrofluoric acid **cleaning** with e.g. choline, rinsing and drying.
DC A85 L03 P43 U11
IN TANAKA, M
PA (DNIS) DAINIPPON SCREEN SEIZO KK; (DNIS) DAINIPPON SCREEN MFG CO LTD
CYC 3
PI JP 02275631 A 19901109 (199051)*
US 5129955 A 19920714 (199231) 13p B08B003-08
KR 9301287 B1 19930225 (199417) H01L021-302
ADT JP 02275631 A JP 1989-120172 19890512; US 5129955 A US 1990-462014 19900108; KR 9301287 B1 KR 1990-116 19900108
PRAI JP 1989-5096 19890111; JP 1989-120172 19890512
IC ICM B08B003-08; H01L021-302
ICS C23G001-02; H01L021-30
AB JP 02275631 A UPAB: 19930928
Process comprises (a) treating the **substrate** with a surface treating agent contg. HF; (b) **cleaning** the surface of the **substrate**; (c) rinsing the **substrate** in pure **water**, removing liq. and drying. The **cleaner** contains silicone and/or its deriv. and surface of the **substrate** is **cleaned** after being rendered hydrophilic.

Appts. to carry out the process is also claimed.

USE/ADVANTAGE - The process is applied to semiconductor **device** with no generation of oxide film on it, effective removal of colloidal particles and without re-adhesion of F on the **wafer**.

In an example, a **cleaning** appts. is set in advance of photoresist coating process. A **wafer** is **cleaned** by 5% HF soln. to removing SiO film on it, **cleaned** with a choline **cleaning** soln., rinsed in pure **water**. Surface of the **wafer** is slightly etched by pure **water** contg. silicone

and F ion or inorganic ion combines with choline cation to form colloidal particles, and covered with OH(-) to make it hydrophilic. The colloidal particles are removed by centrifugal force with the **cleaner**, and **substrate** is dried. As a result, the number of particles remaining is 44 by choline **cleaning** but 111 particles by **surfactant cleaning** and 1105 particles by **H2O2 cleaning**.
1/3
FS CPI EPI GMPI
FA AB
MC CPI: A06-A00E2; A12-E07C; A12-W12B; L04-C09
EPI: U11-C04A1

L89 ANSWER 8 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1986-121928 [19] WPIX
DNN N1986-089955 DNC C1986-051967
TI Liq. **detergent** compsn. for **cleaning** e.g. silicon **wafers** - contains **water, ammonium hydroxide, hydrogen peroxide** and ammonium cpd..
DC D25 E35 E36 U11
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 61060799 A 19860328 (198619)* 4p
JP 63014038 B 19880329 (198816)
ADT JP 61060799 A JP 1984-181844 19840831
PRAI JP 1984-181844 19840831
IC C11D007-18; H01L021-30
AB JP 61060799 A UPAB: 19930922
Compsn. comprises (A) **water** (1000 ml), (B) at least 2.5 mol of **NH4OH**, (C) 0.9-3.8 mol of **H2O2** and (D) 0.1-2.5 mol of at least one ammonia salt selected from phosphate, citrate, acetate, silicate or other inorganic salt and opt. (E) 2-50 g of **surfactant**.

Aq. ammonia and aq. **H2O2** sterilise and remove bacteria and organic fouling and **H2O2** oxidises trace of impurity metals. The aq. ammonia sttacks the surface layer of glass **substrate** to remove adsorbed fouling together with the thin surface layer to improve the wettability of surface of **substrate**. The aq. ammonia turns the **detergent** soln. to alkaline pH to prevent the destruction of insulating material and acts as buffer to stabilise the **detergent** soln. The inorganic cation and **surfactant** retain selectively in the form of electric double layer to protect the surface of metal. The washing power is enhanced by applying ultrasonic wave and heating at 70-85 deg.C.

USE/ADVANTAGE - The **detergent** compsn. does not attack amphoteric elements such as Al and various metal and adheres no scum after the washing. It is suitable for **cleaning substrate** board such as silicon **wafer** before the formation of film.
0/0
FS CPI EPI
FA AB
MC CPI: **D11-A; D11-B14; D11-B20; D11-B22; D11-D07**; E05-S; E10-C02A; E10-C04J; E31-E; E31-K05E; E31-P05D; E32-A04
EPI: U11-C07